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Radio Control

CAR ACTION®

THE WORLD'S PREMIER R/C CAR MAGAZINE

January 1991

RC THUNDERDROME®

FIRST REPORT:
TAMIYA HI-LUX

5 YEARS OF
CAR ACTION

INSIDE LOOK:
THUNDERDROME
WINNER

SUPER SPEEDWAY
SHOOTOUT!

HOW TO:
CANDIES, FLAKES
& PEARLS

CRABIN' CLOD



USA \$3.50 Canada \$3.95

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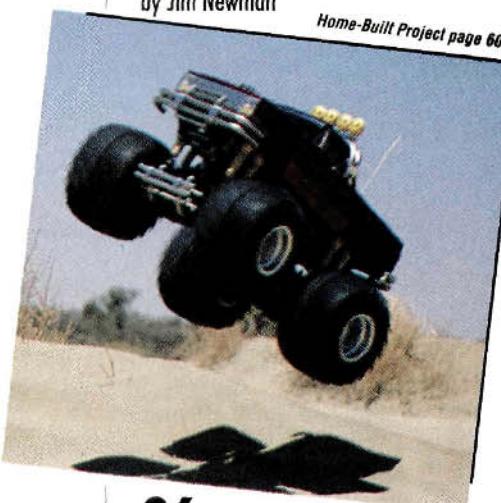
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ON THE COVER: upper right—Connector Inspector; we let 'em fry! (photo by Yamil Sued). Center—Kent Clausen, winner of R/C Thunderdrome's 1990 Superspeedway Shootout (photo by Steve Pond). Middle left—Reader's Ride of the Year: Landmaster (photo by Yamil Sued). Bottom—the awesome Crabin' Clod (photo by Demetrios Mattes).

EDITORIAL

by STEVE POND



SINCE I STARTED racing R/C cars years ago, there have been tremendous advances in the technology that we rely on to make our cars go faster and faster. Unfortunately, the cost of this technology and speed is money—lots of it. This is true for any type of racing; we're not alone with radio-control cars.

The positive side to this is that our cars are now more reliable, and they get where they're going much sooner. The disappointment comes when a diehard enthusiast chooses to bow out because he or she can't afford the hardware to keep the pace. It's quite often that we, with the best intentions, allow some new technology into our toolboxes under the "It'll-be-good-for-all" banner, and it comes back to bite us. One example is the legalization of the 1700mAh cells. This is the fault of no individual; we all wanted to go faster for longer, but we had no idea of the side effects. Now we have batteries commonly used in the modified class that are more expensive, completely unpredictable, and are designated practice packs before the shrink wrap has a chance to melt.

A recent introduction by Sanyo (which should be available in the near future) should ease our battery woes to a great degree. It's the 1400mAh SCR cell. This cell is cheaper than the higher-capacity cells, but the construction is similar to that of the 1200 SCR cell, which has proven itself as ideal for the kind of torture we inflict on it.

I don't want to jump the gun, because the final verdict on how these batteries will perform over the long haul is far from in. But, if the early indications are any sign of what's to come, things are lookin' good. While the rated capacity of the cell is obviously less than what we're used to, you battery whiz kids will recognize that the higher voltage capability of the 1400s translates into increased overall power output—close to that of the 1700s! Should the 1700s be phased out? That's not for me to say. It's my opinion, however, that it would be a step in the right direction.

On the lighter side of the hobby, there has been a shift in the right direction concerning entry-level, reasonably priced cars. Gone is the tremendous gap between the racing machines and the cars affordable enough for newcomers to this hobby. The entry-level car of the '90s is now one of those high-tech racing machines made of less expensive materials. For the most part, these cars are nimble enough to compete on a regular basis while staying within the grasp of our wallets. Graduating to a more serious form of racing only requires that you piece together some of the go-fast apparatus—and it can be done at your own pace, all the while staying in the hunt for victory. A completely new car is no longer necessary.

Much like the shifting tides, there are ups and downs to everything we all must endure. These most recent developments in the R/C car hobby are keeping the tides on the upswing; just hang on and ride the wave! ■

Radio Control CAR ACTION

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ON JUNE 26, 1990, APPLICATION FOR ABC (AUDIT BUREAU OF CIRCULATION) MEMBERSHIP WAS FILED BY R/C CAR ACTION.

LETTERS

We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, owing to the tremendous numbers of letters we receive, we cannot respond to every one.

LETHAL DRIVE

I own an RC10, and I'm considering replacing the stock gearbox with an after-market gearbox such as Team Pit Stop's Chain Drive, Trackmaster's Belt Drive, or the new A&L Lethal Weapon Belt Drive. I think the A&L would be better because it's fully sealed, but what about replacement parts for it? What about belt breakage? What's the average lifespan of the belt in the Belt Drive? Do you plan to do a test report on the available after-market trannys for the RC10? I would greatly appreciate it.

TONY CATHCART
Lake Lure, NC

Tony, for a comparison of the Associated, MIP, Team Pit Stop and Track Master trannys see the article "Transmission Decision" in our 1990 Off-Road special issue. The A&L is very new, and we haven't tested it yet, but you're right—it does look like a killer! CC

FINAL CONFLICT... SUZUKI'S REVENGE?

In June, you gave Tom McAdam a subscription. I picked up the October issue of *RC Model Cars and Trucks*, and he won a subscription to *their* magazine with your custom trailer! That's gratitude for

you! I know it's legal, but using your trailer to win a subscription to another mag?—that made me mad!

Before you go off the deep end, I picked up the September issue of *RCMC* because the cover said "Tamiya's Monster Tank Crusher," which sounded like a kit, but it was just a conversion. On their October cover, it said something about 2-second dragsters, so I bought the issue, thinking that this would be a "how-to" article (it wasn't). I'm glad you don't use misleading titles on *your* covers. In short, the mags were a gyp.

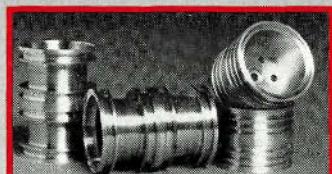
In your October issue, you said that the winner of the ZR-1 challenge received a ZR-1. You meant an *R/C* ZR-1, right? (If not, Bloomington Gold is nuts!) Hurry up

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FAT TRACKS

with the Clash of the Titans, already! It's about time to see if the Clod will go down (not that I'm in favor of it)—and this time, *no ball bearings!* I read the last clash in a friend's collection, and I was disappointed that you used bearings. Sure, people usually add them, but some don't.

Where's Project Villain, Chris? You mentioned it in the August '89 issue. Later!

JONATHAN ESTEN
Cary, NC

Jonathan, "Clash of the Titans—Part II," known as "Suzuki's Revenge" or "The Final Conflict" is closer than you think! We have to use ball bearings because some manufacturers still put useless plas-

tic bushings in their kits, although others have seen fit to upgrade to bronze bushings—we salute them. Because we need to "control" the "experiment" as much as possible, we use ball bearings across the board.

As for "Project Villain," it, too, is close by. Last I heard, the winner of the Z-1 Challenge was seen cruising the streets of downtown Bloomington with the dangerously beautiful Brigitte Peugeot.

CC

BUSTER BILL'S DEAD-SHORT

The true test of a good magazine might be that you can read it six or eight months after it was published and still be inter-

ested in it. Well, today I was flipping through the January '90 issue, and I have a few questions.

The first question might be on other readers' minds, too. Whenever I see an ad for a motor, the braided wire that comes off the brush is shown exiting through the spring slot. It's then routed behind the spring and up and over the brush hood. Why? I try to never let this wire touch the hood. Do the advertisers know something I don't? While we're out in left field, on page 127, Sheldon's Hobbies advertises a Trinity aluminum endbell. What keeps this from being a dead-short? This setup looks like it would

(Continued on page 18)

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PUBLISHER'S PAGE

by LOUIS DeFRANCESCO, JR.

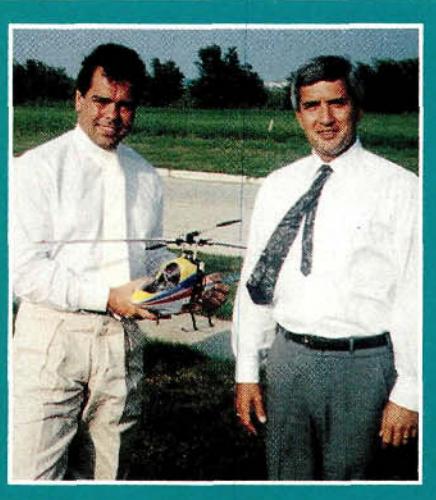
THE THIRD ANNUAL R/C Thunderdrome race in Encino, CA, was a great success. For those of you who have never seen R/C cars consistently racing at speeds in excess of 60mph, it's quite a sight! Thunderdrome is actually a bicycle velodrome track with superhigh banked turns that enable the cars to remain stable at such high speeds.

Dan Moynihan of Dan's RC Stuff and Gary McAllister of McAllister Racing conceived the idea three years ago, and the rest is history. *Car Action* got involved as the major sponsor last year; this year, Futaba joined the show and donated generously. Watch for coverage in some of the full-scale automotive magazines that sent editors to cover the extravaganza, including Jeff Smith of *Hot Rod*, Doug Kott of *Road & Track*, Larry Wollen of *Stock Car Racing*, Jeff Vetrino of *Autoweek*, Mike Kanke of *Stock Car Driver* and Will Hansel of *Circle Track*. We thank all these magazines for supporting R/C with their coverage. It's safe to say that Thunderdrome has become an R/C racing institution, and we'll keep striving for its continued success.

With this issue, we celebrate our 5th anniversary. *Car Action* is the R/C publication with the largest circulation, and it continues to grow. The industry has gone through a dramatic evolution over the past five years. Most notable is the level of sophistication that R/C enthusiasts have reached. Cars that were considered to be of racing caliber 5 years ago are now entry level—a testament to technological advancements, as well. Racetracks are popping up with unprecedented regularity throughout the country—both off-road and superspeedway—and they're attracting the interest of many who otherwise might never have been exposed to the hobby.

Monster and racing trucks seem to be the latest rage, but off-rovers are still the industry stalwart. We've seen the great shift to 1/10-scale on-road racing, yet areas like 1/12, 1/8 and 1/4 scale have remained status quo. The resourcefulness of modelers has brought about a wave of scale vehicles, and radio control has penetrated other markets, including robotics and Hollywood. (It's much more cost effective to blow up a scale model!)

I'm very optimistic about the future of this hobby, including R/C boats, airplanes, gliders and helicopters. R/C is exciting and three-dimensional, and it appeals to more people daily. Spread the word! ■

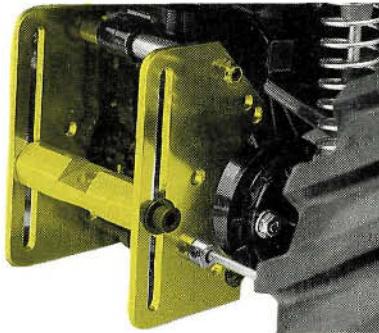


Publisher Louis DeFrancesco (left) and Mike Cioli, president of Hobby Dynamics, are pictured holding the newest in R/C technology—the Kalt Electric Helicopter. It's powered by Ni-Cd batteries, and there's no glow fuel, starter or heavy support equipment to carry to the flying field. The chopper was very fast and capable of aerobatics! Hey—there's more to R/C than cars!

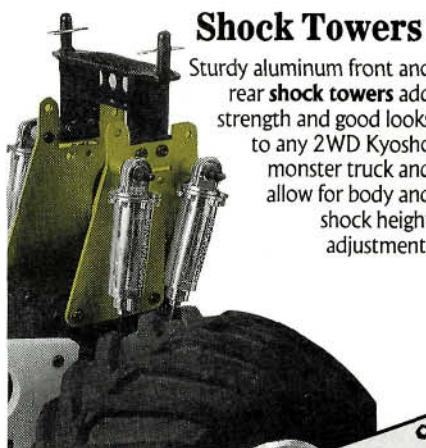
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Sturdy aluminum front and rear **shock towers** add strength and good looks to any 2WD Kyosho monster truck and allow for body and shock height adjustment.



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INSIDE SCOOP



by CHRIS CHIANELLI

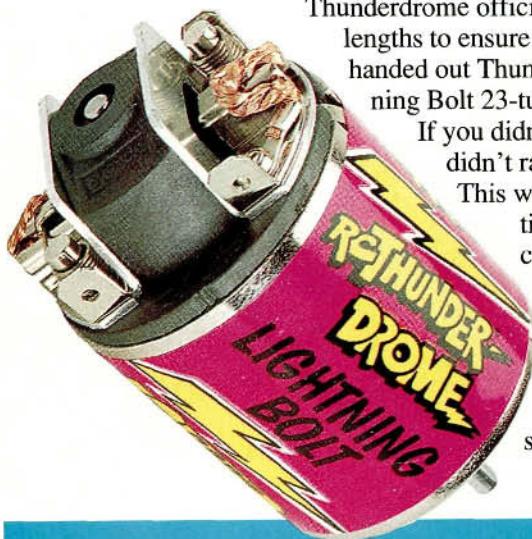
As directed by the Ayatollah of Radio Controlla, Commander Crash Chianelli reporting back to the faithful followers of the Grand High Exalted with pertinent information! I'm back from my latest espionage excursion with microfilm, spy shots and stolen communiques that read as follows:



COLORFUL KINGS

JG Manufacturing—the off-road-truck conversion people—will soon offer this 1/10-scale King Cab body in bright colors. From the rumblings I hear, more bodies specifically for off-road truck racing are in the works at JG. I hope that painted versions will be available, too.

NO CHEATERS!



Thunderdrome officials went to great lengths to ensure a fair race. They handed out Thunderdrome Lightning Bolt 23-turn stock motors.

If you didn't have one, you didn't race; end of story.

This was a simple solution to an ever-increasing problem.

Stricter local track rules and handout, inexpensive motors may be the answer to the stock-class problem.



lathe crave

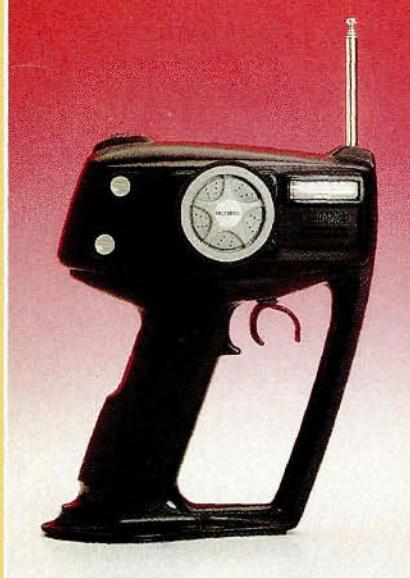
Team Tanaplan has introduced this new commutator cutting lathe. It has full ball bearings and an anodized-aluminum frame, and it uses standard cutting tools (either carbide or diamond). The unit features a linear cutting stroke and a 550 drive motor that needs 12V DC power.

Creepy Crusher

Parma International has gained the rights to produce, in 1/10-scale, the infamous and unique, '52 Chevy delivery-van puller known as the "Grave Digger." This latest addition to Parma's extensive line is an accurate reproduction of the full-scale crusher. It comes with a full-color decal set that includes tombstones, skulls and green flames! It should be available by the time you read this.



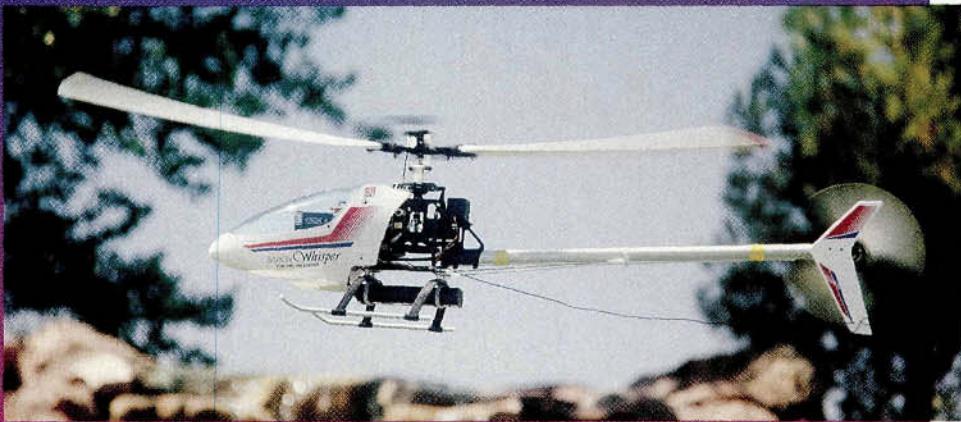
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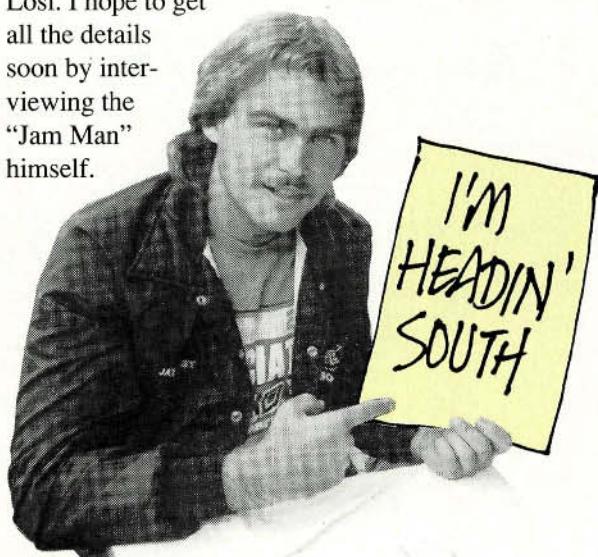
The new Acoms Technosport Mk-III from MRC is reported to have a downsized transmitter with good balance, a comfortable contoured grip, a steering-rate thumb wheel and servo-reversing. The new 35.2 inch/ounce AS-11 servo is smaller than the previous one, and the receiver has BEC. The transmitter is contoured for comfort, and its size makes it suitable for smaller hands.

Silent Chopping or Vertical Venture



If you want to take a break from the horizontal race pace, maybe an encounter with a vertical venture is the answer. Hobby Dynamics' Kalt Whisper electric helicopter runs on the ever-popular Mabuchi 540 motor and uses a 9.6V, 1100mAh pack—familiar stuff! Unconfirmed reports say that the Japanese are using Whispers equipped with hooks to perform turn-marshall duties in less accessible parts of the track.

JUST IN! Jammin' Jay Halsey has made an unexpected move away from Associated to the Pomona-based Team Losi. I hope to get all the details soon by interviewing the "Jam Man" himself.



BULLHEAD-TITAN TITLE CONTENDER

Just when I thought the "Clash of the Titans" title was between the Clod and the USA-1, look what happens!—a Bullhead jumps in my face! That's right; I guess Tamiya got wind of the Kyosho USA-1's capabilities and came up with this new, 4WD, monster tractor. Will it be the final master of titanic disaster, or is it the in-CLOD-nito truck? Stay tuned—of course!

Compromise No More

MAXIMUM DYNAMIC RANGE

Astro's New Model 205 Hi-Rate Electronic Speed Control has the largest dynamic range available anywhere. It works with 6 cells to 32 cells...efficiently. It works with 50 Watt Ferrite 05 motors and 2000 Watt Cobalt 60 FAI motors.

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Four IRF-Z30 MOSFETS in the brake circuit have a peak rating of 500 Amps and a 5 second rating of 100 Amps. Powerful enough to stop an 80 mph dragster or a 400 lb sled. And the regenerative braking circuit pumps amps back into your nicads during braking.

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Hi-Frequency switching is much more efficient than frame rate switching, especially at lower throttle settings. Motor heating is greatly reduced, motor runs noticeably longer, and throttle response is extremely linear.

SIGNAL FILTERING

A special triple pole low pass filter in the decoder circuit produces a SOFT START and a very smooth and precise speed command. Try it once and you will never want to return to the spastic control you live with now.

16 AMP SHOTKY DIODE

This massive flyback diode greatly reduces switching losses during partial throttle operation. The control runs much cooler and more efficiently and your nicads run longer.

NO MORE COMPROMISES

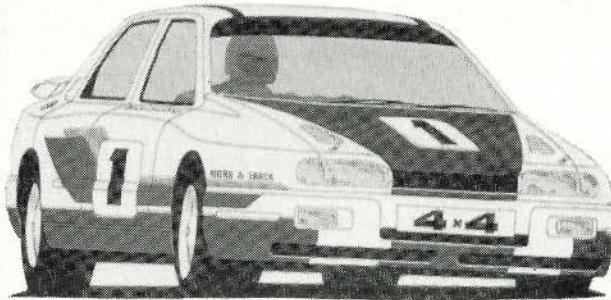
I designed the Astro Model 205 Hi-Rate Speed Control with No Compromises. I gave it all the features that serious electric competitors have been asking for. I hope you like it.

Bob Boucher
Bob Boucher



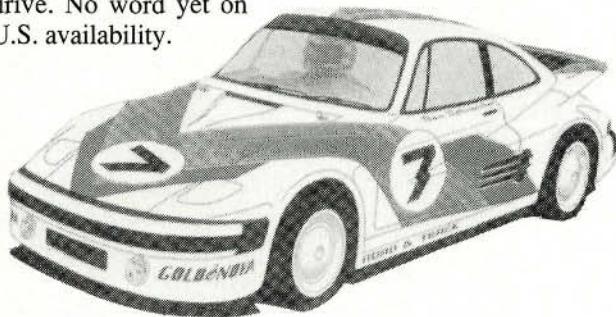
AstroFlight INC.

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SCHUMACHER ROAD & TRACK

The Englishman has introduced two surprises: the 4WD Ford Ciera RS 4x4 and the 2WD Porsche 911 Turbo SE. The Rallycross RS 4x4 comes with full ball bearings, Kevlar belts, alloy shocks and, of course, fully independent suspension. The 911 Turbo SE features fully independent suspension, an alloy chassis and rear-wheel drive. No word yet on U.S. availability.



POWER MONSTER

Power is the only thing Monster trucks understand. And Team Astro speaks their language. Ten super power cobalt magnets, a skewed seven slot armature, twelve turns of 22 gauge wire, an oversize commutator, oversize brushes, and adjustable timing. They all spell FULL PULL POWER.

RECORDS ARE FALLING

Team Astro Pullmaster motors are powering Monster trucks to new records at NARCTPA truck pulls all over the midwest. The reasons are many but they all boil down to one thing...the Team Astro Pullmaster Cobalt Motor delivers a full pull every time.



New/Old Battery Manufacturer



Long-time manufacturer of rechargeable battery cells, Gates Energy Products Inc. has recently decided to enter the R/C hobby field. I've been told that Millennium Power Systems (as the division is called) will offer their cells in a variety of sizes and numbers of cell packs. I'll get more info, and let you know...!

I'll see you next time—or sooner, if I catch you in my spyglass! CC

NO NEED TO BE LEFT BEHIND

See your favorite hobby dealer TODAY and ask for the Team Astro Pullmaster Cobalt motor.

FLASH!

World Records at NR/CTPA World Championships

On October 14th & 15th

TWO WORLD RECORDS were set using Team Astro PULLMASTER motors
2WD Open I: 203 lbs.
1ST PLACE: Charles Allen
2WD Open II 350 lbs.
1ST PLACE: Gary Kmit -

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LETTERS

(Continued from page 9)

be troublesome. Again, is there something I don't know?

My next question concerns one of your readers. The "Reader's Ride of the Year" is in the January '90 issue, and one stands out (the winner, of course). I have the same tank, but mine has only one motor. I'm interested in finding out how Larry Matics fit a pair of RS540 motors into his tank. Could you forward my letter to Mr. Matics, or print my address and letter in your column, so if anyone out there is capable of making the transformation to twin motors, they can contact me?

Well, my batteries are charged, so I'm gonna go crush some jumps until my tank breaks! See ya' at the track, and have fun!

BILL J. ELLIOTT
721 Mohawk Drive
Round Lake Heights, IL 60073

Hey, Larry! Here's Tank Buster Bill's address if you'd like to be nice and help him out. (I can't print Larry's address without his permission.)

Bill, the terminal plates are insulated from the aluminum endbell with phenolic gaskets, and the screws that hold down the plates also have non-conductive washers. If you've just bought a motor with an aluminum endbell, be careful when you solder the capacitors on. It's easy to short things out if the capacitor's lead isn't insulated.

CC

DEAL WITH IT

Professor Chianelli, in the "Letters" section of the October '90 issue, the question of monster trucks versus racing trucks was raised again, and you asked readers to reply. I'm a reader, and this is my reply!

In all my years watching racing coverage on "The Nashville Network" on Cable, I've never seen a Bigfoot, a USA-1, or a Gold Digger follow "Ironman" Ivan Stewart around a stadium race course. I'm sure that if a monster trucker wanted to try to negotiate the course, there wouldn't be an argument, but these two forms of racing just aren't interchangeable.

Because I own a Tamiya Leopard A-4 Tank (with one blown clutch and a modified motor), I understand the feeling of not having "a ghost of a chance" against

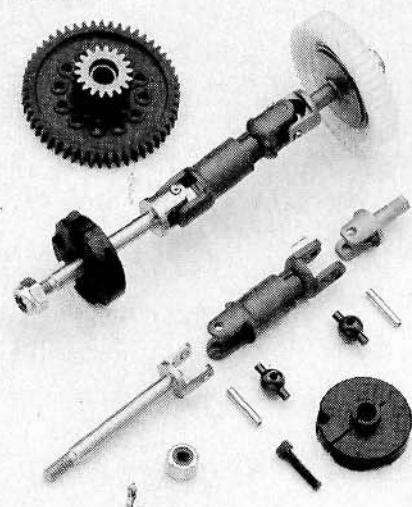
(Continued on page 20)

NEW FROM THORP

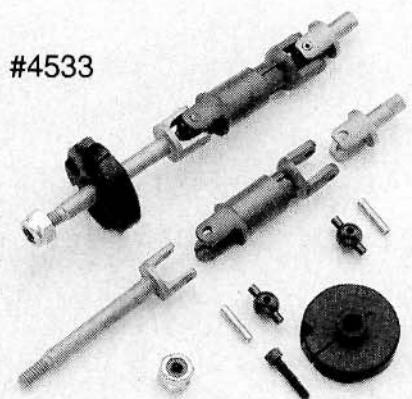
Thorp Manufacturing's introduces three new kits to help you get even more performance from your Blackfoot and RC-10. Check 'em out!

For your Blackfoot:

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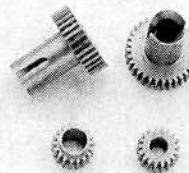


#4533



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#4750



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LETTERS

(Continued from page 18)

a JR-XT with a Mabuchi 05 closed-end-bell airplane motor. I also have an Associated TQ 10, however, and a friend has abandoned his RC10 here, so I can understand the desire to totally annihilate the competition. Yes, both of these Associateds cost a lot, but both perform equally well with stock motors, and they eliminate the need to "move up" to a different car each season.

I've studied the situation from both sides, and I don't think that separating monster trucks from racing trucks is a good idea. What's racing without the agony of defeat? What sporting event doesn't have a "short end of the stick"? If you can't handle losing, do what I do. I show up for open running, and when race time comes, I put my cars away and charge batteries, or clean chassis for the guys who are marshalling. I'm still a part of racing, but I don't have to deal with losing. "No brains; no headaches!"

ELLIOTT WILLIAMS
Round Lake Heights, IL

I agree, Mr Bill. As for not dealing with losing, however, I think I can hear ET saying, "E-L-L-I-O-T—Y-O-U I-D-I-O-T!" I think he only means to say, "No guts, no glory." CC

HOW LOW CAN YOU GO?

I'm writing this letter because of something that happened to me at a local race-track. One day, I went to the track after modifying my monster-truck's body. (I lowered it slightly and had to cut holes to clear the shock towers.) The race organizers said that I couldn't race because there was a NORRCA and ROAR rule against it. I checked the rules and found nothing about this modification. I also checked with other tracks, and they had no problems with it.

Now they tell me it will be a rule in their 1991 rule book because racers wanted it. I haven't found this to be true. I'd appreciate any help you can give me on this matter.

ROB TAGGART
Staton, CA

Rob, I looked at a copy of NORRCA's rule book and found nothing on this subject. In the ROAR book I did find this: "C102: For closed-wheel bodies, no portion of the chassis, wheel/tire, or equipment may extend beyond the body except to the rear. Openings in the body other than those appropriate to full-size car openings, grill, scoops, air vents, etc., will be kept to a minimum...."

I've never seen a full-size car with shocks sticking through its hood, have you? The purpose of this rule is to keep the model cars' appearance close to that of full-size cars. I don't know how much they protrude on your car, but if it's enough to cause a fuss, why bother? There's no advantage to setting up your car this way. Mount the body so it's right against the shock tower, and it will be low and legal. If this response doesn't help, have a meeting to decide how to handle the situation at your local track. JH

AMPUTATED ANTENNA

I'm a beginner in the R/C world. I own an FX10 and have some questions. The antenna on my car caught in the tire and was cut. The owner of my local hobby shop said that adding another antenna would change the frequency. How can I fix it? When the battery pack starts getting weak, I can only control the car for a couple of seconds before it runs away. Is this normal and, if not, how can I fix it?

CHRIS BUCHANAN
Alexandria, VA

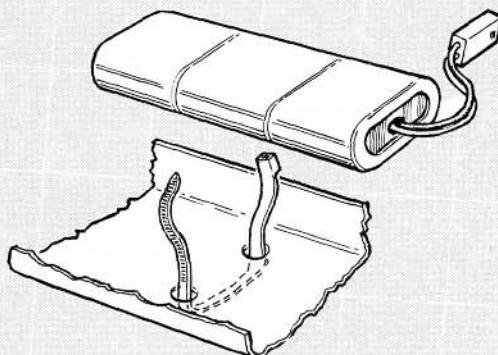
Chris, these are common problems for newcomers. As far as fixing the antenna is concerned, you should check the length of a new one, and add an appropriate piece of wire to make up for the lost length. You could also send it back to the manufacturer to be re-tuned.

The BEC system causes your car to run away. When the battery is low, the drain caused by the motor depletes the power going to the radio. The servos will stay in their last commanded position. To fix

(Continued on page 76)

PIT TIPS

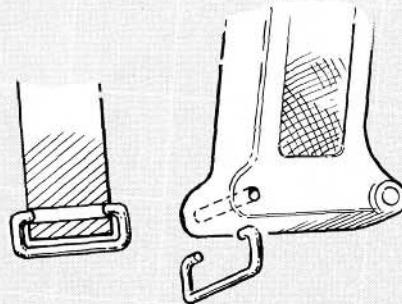
by JIM NEWMAN



RC10 WEIGHT LOSS

To reduce your RC10's weight and increase acceleration, remove the battery holder and drill two holes in the bottom of the chassis. Thread a plastic tie-wrap (available in packs from Radio Shack) through the holes, and use it to secure the battery. (Smooth the edges of the holes to prevent them from cutting the tie-wraps.)

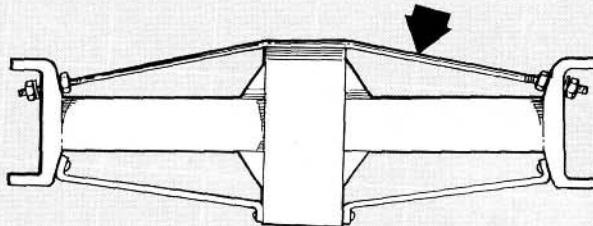
Alan Blustein, Ft. Lauderdale, FL



AIRTRONIC PISTOL-GRIP FIX

When the strap holder on his pistol-grip radio broke off, this enterprising owner drilled a hole through the radio handle and then made a simple C-clip from ever-useful coat-hanger wire! He inserted the clip's ends into the holes, and threaded the strap through it.

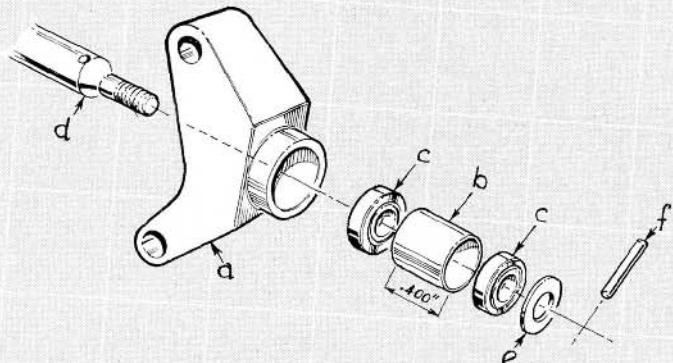
Jim Lambert, Sarasota, FL



CLOUD BUSTER AXLE BRACE

Hard landings often cause axle housings to break, despite the factory-installed braces across their tops. To strengthen them, cut and bend coat-hanger wire (arrowed), and position it below the axle so it firmly contacts the drive case. Thread the wire ends (probably 4-40 wire) and screw them into holes drilled in the E-brackets, using nuts on each side. Tighten the wire with the outboard nuts, lock them tightly with the inboard nuts, and hold them with Loctite or CA.

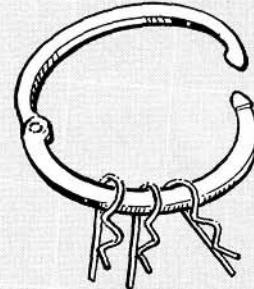
Dale Alexiuk, Roseau, MN



RC10 AXLES FOR THE RAIDER

The selection of wheels and tires for the Raider is limited, but with RC10 axles, you can use a variety of RC10 equipment. Bore-out the Raider hub carriers (a) to fit a $\frac{3}{8}$ -inch-diameter brass tube (b); press the tube in until it's flush, and secure it with CA. Press in the two replacement $\frac{1}{4} \times \frac{3}{8}$ -inch RC10 bearings (c), and fit the RC10 axles (d), the thrust washer (e) and the drive pin (f). It's easy to bore-out the carriers with a hand drill if you use increasingly larger drill bits (in $\frac{1}{64}$ -inch increments).

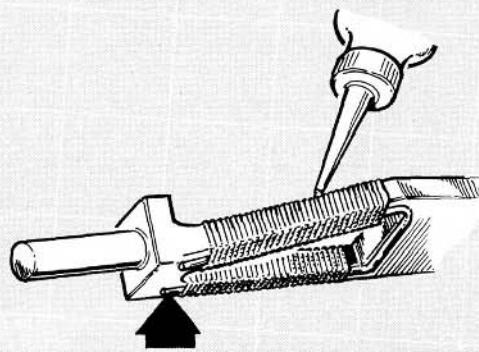
Dennis W. Bloss, Clio, MI



BODY-CLIP ORGANIZER

When you need to replace a body clip quickly, they're always lying in a tangled mess at the bottom of your tool kit. This snap-together key ring eliminates that problem, because it keeps the clips right at hand. You can also tie the clips to your car with a short piece of nylon cord—just like the full-size cars! Then, you definitely won't lose them!

David Uran, Ramona, CA

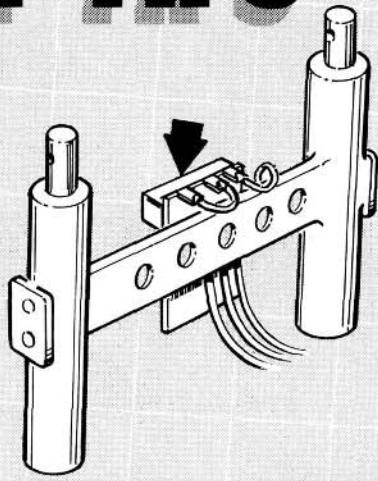


WIZARD A-ARM REINFORCEMENT

Here's a unique way to reinforce A-arms so that they won't break during a race. Bend a piece of $\frac{1}{16}$ -inch music wire (arrowed) and glue it to the bottom of the A-arm with CA. To hold the wire on the arm, wrap thin cord around it and saturate it with CA. (Remember: whenever you use a lot of CA, do it outside, so that the fumes disperse quickly.)

Stephen S. Warner, Spokane, WA

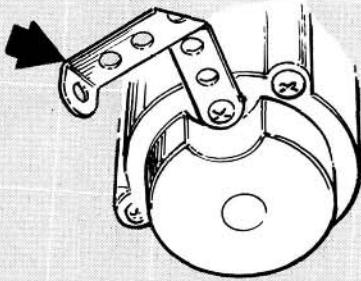
PIT TIPS



BLACKFOOT RESISTOR MOUNTING

If your car's front wheel splash mud and water onto your speed-controller resistor, move it to the rear of the body-post bracket and attach it with J & B Weld silicone glue. This keeps the unit high and dry and reduces the risk of breakage caused by thermal shock.

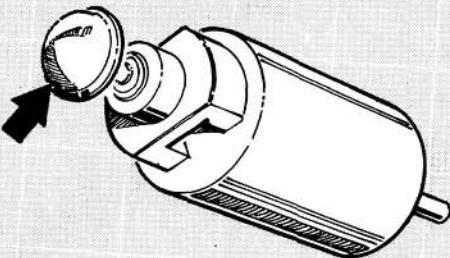
John Marshall, Aledo, IL



CLOD BUSTER DIFF-BRACKET FIX

Because they kept breaking, this contributor regularly spent \$6 for differential-bracket replacements. His solution was to fold and bend a perforated metal strip from an erector set as shown!

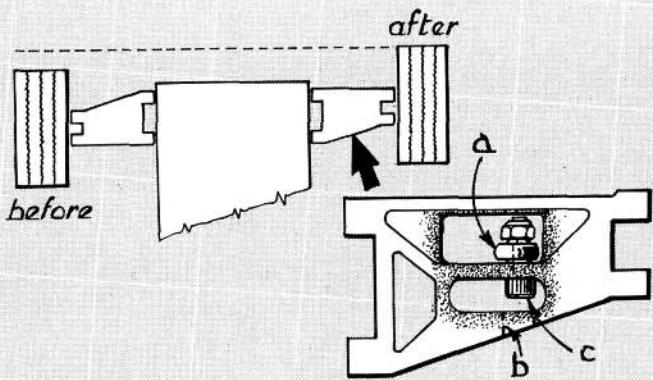
Matt Tofflemoyer, O'Fallon, MO



MOTOR-BEARING DIRT SEAL

The rubber shock gasket that usually fits over Tamiya's yellow shock units also snaps over the endbell bearing to keep dirt out and oil in. This simplifies maintenance and prolongs bearing life. Don't, however, use the gasket as an oil reservoir: too much oil passing through it will contaminate the commutator and damage the motor.

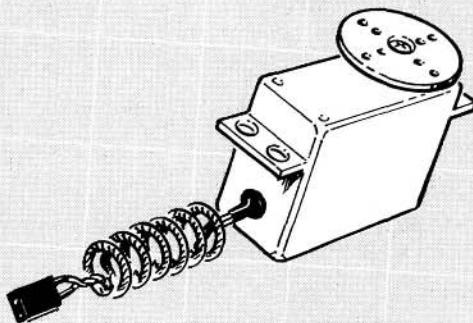
Collin Lockhart, Rochester Hills, MI



JR-X2 LENGTHENED WHEELBASE

This modification moves the JR-X2's front wheels $\frac{1}{2}$ inch forward (see "Before" and "After" sketches). Remove both front A-arms and turn them over so that they're raked forward. To make clearance for the shock's bottom end (a), cut away the web in the A-arm, drill a $\frac{3}{16}$ -inch hole through the flange (b), and insert a 4-40 $\times \frac{5}{8}$ -inch socket-head screw (c), which is attached to the lower end of the shock unit. This contributor won his first race and thinks that the longer wheelbase helped. The modified arms seem to be as strong as ever.

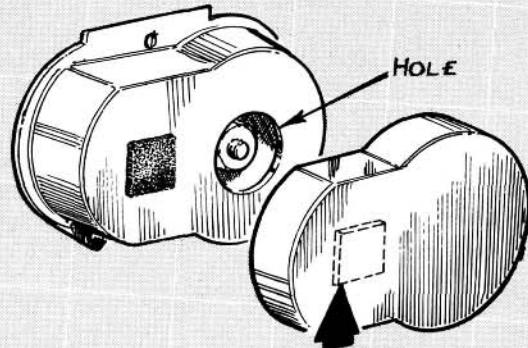
Steve Whitmill, Benicia, CA



TIKY SERVO LEADS

Irritated by the length of the servo leads that were fastened across his car, this driver tightly wrapped each one around a suitable dowel. Then he removed the dowels, leaving each lead neatly coiled. Now, the inside of his car looks organized!

Jamie Fong, Calhoun, GA



RC10 QUICK-RELEASE DIFF COVER

Do you hate having to remove two screws to access your RC10's differential adjuster? Cut a hole in the diff cover to expose the adjusting nut. Then trim a second cover, and apply patches of Velcro® to it (shown by the arrow). The Velcro holds the second dust cover over the first; to reach the adjuster, just peel it off.

Brian Twardeski, Horseheads, NY

THIS, THE SECOND annual Reader's Ride of the Year award, is how we pay homage to the most outstanding car, truck, or any other action contraption as long as it's R/C! Not just any vehicle can make the Readers' Rides grade: it's the domain of the mechanically disturbed who amaze (and frighten) us each month with their homegrown projects.

These unique, sharp-looking (and often well-photographed) aberrations are dreamed up by the many Dr. Demento Inventos out there whose cure for creative insomnia is to drink still more coffee. (They do, however, sweeten their Coca-Cola with honey, not sugar.)

Reader's Ride of the Year



by CHRIS CHIANELLI

10·READER'S RIDE OF THE YEAR·

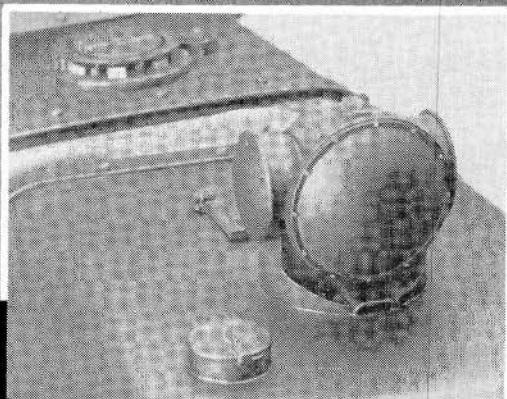


And now, ladies and gentlemen, it's my pleasure to add Mr. Robert Haverfield, Jr. to the Hall of Creative Killer Elite Fame!

WASTELAND WINNEBAGO

As the end of 1990 drew closer, the question of "Which car will be Reader's Ride of the Year?" was often discussed by the Car Action editors. Then we received Robert Haverfield's "Landmaster" (as Rob calls it, but we like "Wasteland Winnebago" much better). This highly creative, handmade project was so impressive that the decision was made for us—this was it!

•READER'S RIDE•
OF THE YEAR•



SPECIFICATIONS

LANDMASTER

Type Sick
 Scale Unknown
 Sug. Retail Price Priceless

DIMENSIONS:

Overall Length 31 inches
 Width 11 inches
 Wheelbase 13 inches
 Front Track 8.5 inches
 Rear Track 8.5 inches

WEIGHT:

Gross (w/bat.) 18 pounds,
 14 ounces (just over ROAR
 limit for Sci-Fi class)

BODY:

Type Scary
 Material Hand-laid fiberglass
 over balsa

CHASSIS:

Type Two-piece main frames
 with articulated center
 Material Aluminum and fiberglass

DRIVE TRAIN:

Primary Belt
 Differentials Two Cook ball diffs
 Bearings/Bushings 52 ball bearings

SUSPENSION:

Type (f/r) Orbital

TIRES

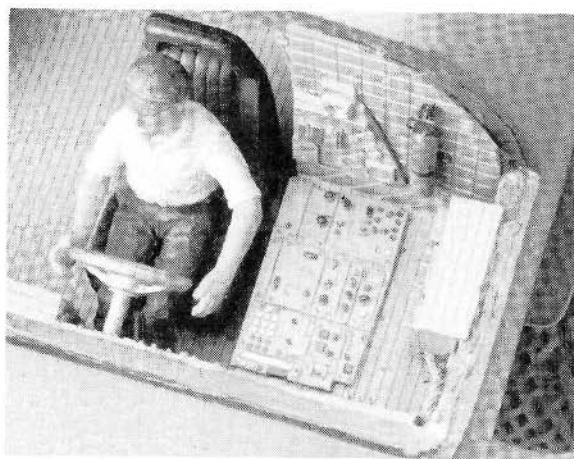
Type (f/r) Pro-Line Waffle AC-16

ELECTRICS:

Motors Two Trinity stock
 Batteries Two 6-cell;
 one 4.8V auxiliary
 Speed Controller Novak T-1X

This is the missile-tracking device that guides the ground-to-air missiles to their targets. The emergency escape hatch in the background is functional, but it has never been needed!

Featured in the December 1990 "Readers' Rides" section, Robert's creation was modeled after the vehicle in the movie "Damnation Alley." The Landmaster's movements are amazingly realistic because of its articulated center, internal and external lighting and four, three-wheel, planetary drive units that give it a total of 12 drive wheels! The most striking feature is the planetary unit when it's in action. Just like the vehicle in the movie, when the Land-

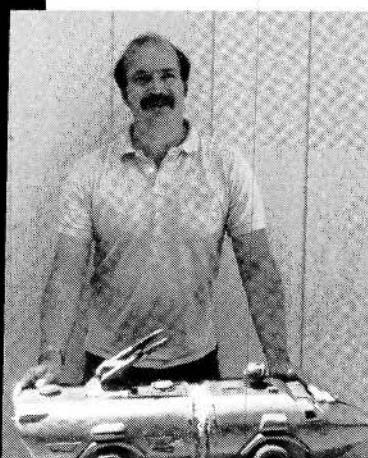


master encounters a large bump or hole, its wheels actually rotate around the main drive axles to negotiate a path around the obstacle—very cool! This 52-ball-bearing monster is equipped with a Novak T-1X speed controller that's hooked to a polarity-reversing switch that provides it with fully proportional throttle in reverse.

The Landmaster uses two Trinity stock motors that supply the power to the main ax-

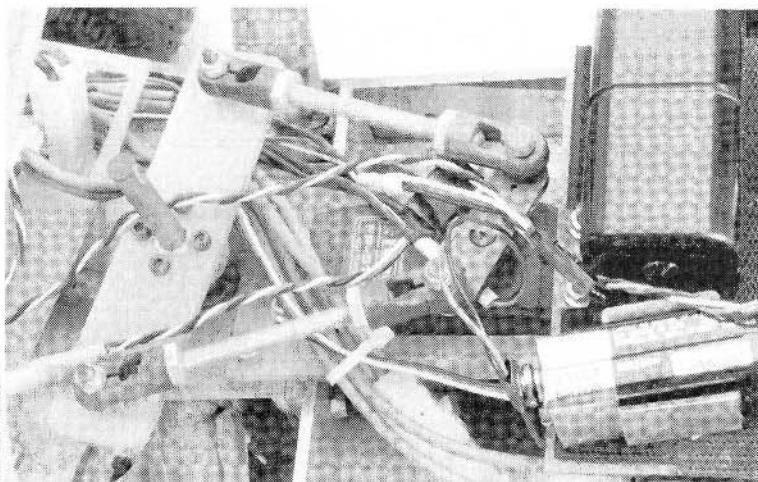
You have to see the detail in the cockpit to believe it! All the panels and the dashboard can be illuminated if you have to turn 'em on.

les by way of belts that drive two Cook ball differentials. It needs two 6-cell packs and one dry-cell auxiliary pack for the lights and the rocket-aiming device. Oh yeah, you can fire the rockets! Although this isn't recommended by *Car Action* or Estes Rocket Co., I'm sure the Landmaster will get the Ayatollah's Seal Of Sickness award if he ever returns with it. (He took off with it two weeks ago, and we

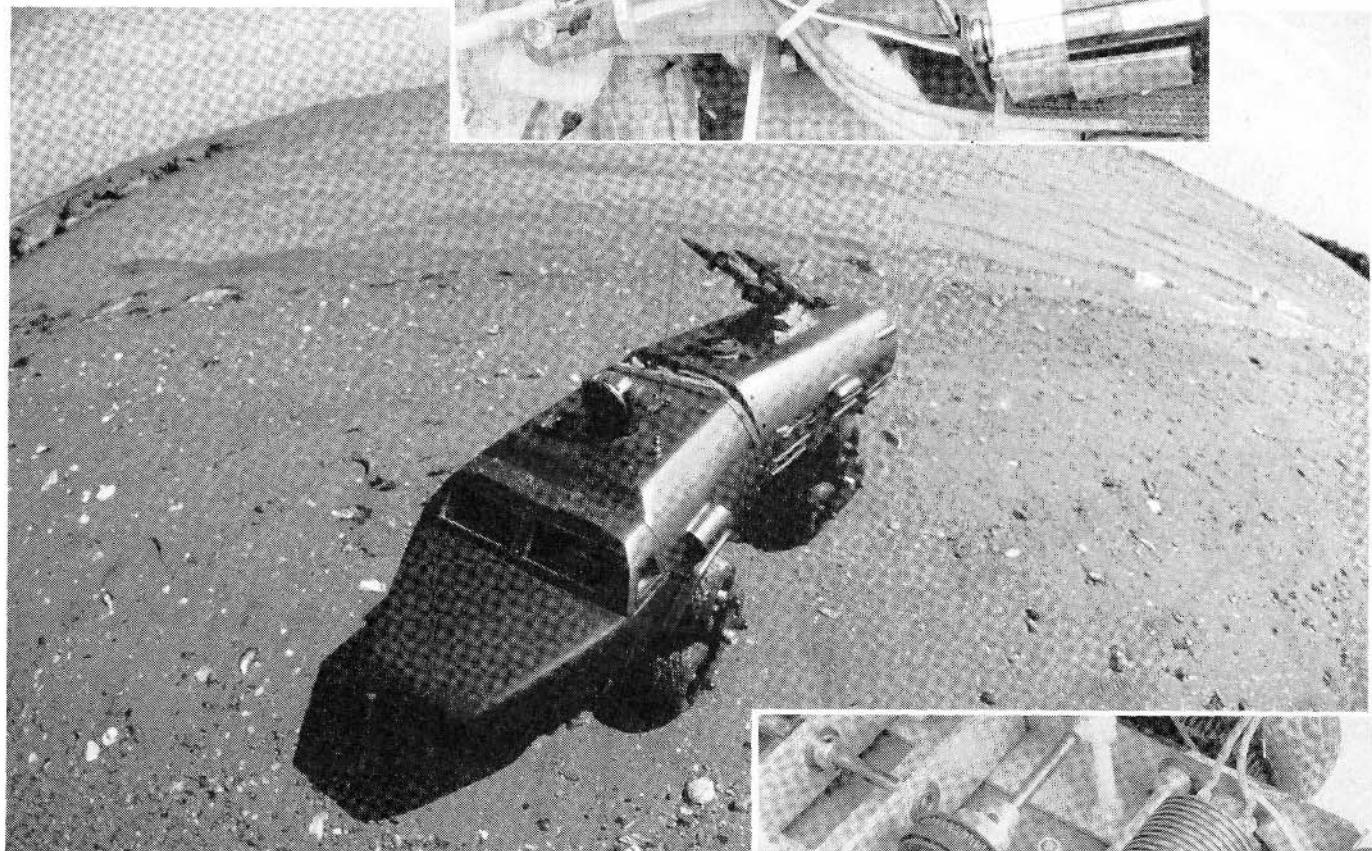


Here's the proud creator of the Landmaster, Robert Haverfield Jr. Wait 'til you see his other creations!

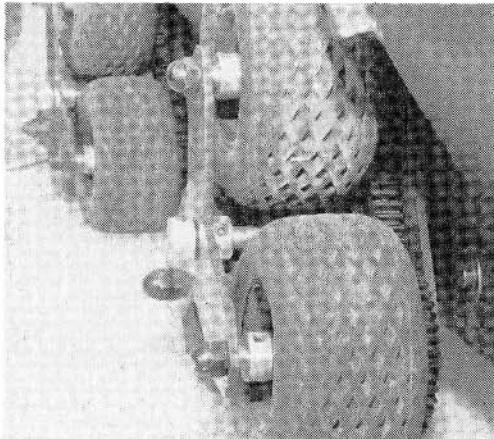
READER'S RIDE OF THE YEAR



This push/pull steering setup does a great job of maneuvering the beast through debris. Notice the 1/4-scale servo and heavy-duty linkages.

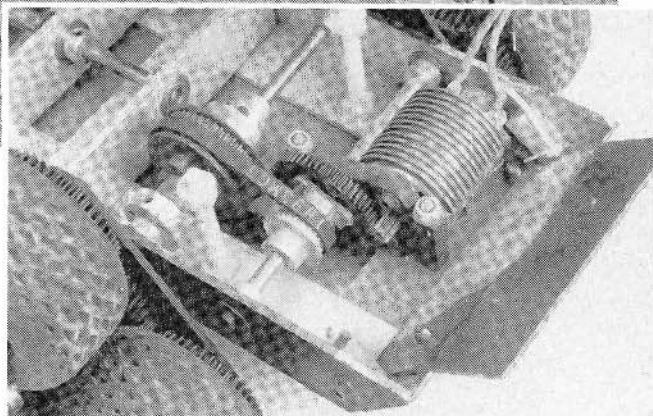


Below: All three wheels move at the same time, but only two can touch the ground at once. Although the Landmaster doesn't have a suspension, the rotating wheel assembly easily adjusts to the terrain. Right: Robert designed the drive train and built it using parts from other cars. Notice the pan-car motor mount.



haven't seen him since. He knows a winner when he sees one!—sorry, Rob.)

Robert told us, "My father always encouraged and inspired my efforts. Someday, I hope to get a chance to do work for films." I think he's got a chance, because the Landmaster is an incredible piece of work! We salute Robert for his undertaking and, most of

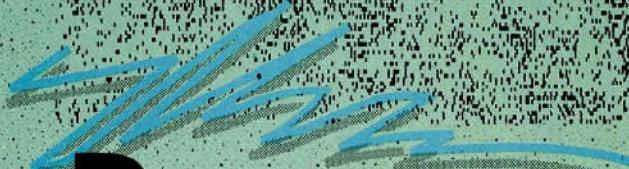


all, for completing such an extensive, complex project, which he has dedicated to the memory of his father, Robert Haverfield, Sr.

The project took more than a year to complete (hundreds of hours), and the materials used cost over \$2,000. I'm not

surprised: the handmade drive train alone is a commendable example of creative engineering!

Robert's next project promises to outdo the Landmaster. Hard to believe?—I don't think so, but then, I know what it is. So sorry—I can't tell you; it's top secret! ■



READERS' RIDES

Welcome to Readers' Rides. This is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. If you want to join the growing ranks of Readers' Rides winners, send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description. Who knows?—the Ayatollah of Radio Controlla might pick your photo.

If your ride is chosen, you'll receive a one-year subscription to *Car Action*, or we'll extend your existing one. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1991. Send your photos to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. Be sure to write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you!

of Carson, CA! While prepping a shot for "Readers' Rides," part of his room burst into flames, and they soon surrounded his car! Sensing an opportunity, he quickly grabbed his camera and shot the photo that you see here. Yes, his RC10 with its '69 Camaro Z28 body survived! For quick thinking in a crisis, Danny gets a *Car Action* subscription.



CLOD BRUISER

David Salazar of North Bergen, NJ, started with a Clod Buster as a base, then added parts until he had two Clods (a modified one and a stock one built out of the leftover parts!). He replaced the stock chassis with one from ESP and added nearly every "hi-po" goodie that ESP makes! The chassis is topped by a Bruiser body, and a blown Keith Black Hemi sits in the middle of the hood. The blower belt actually turns (it's powered by a small motor under the oil pan). This is definitely one of the baddest trucks around!



CRAZED TRUCKS?

Ryan Smith's JR-XT (complete with Novak T-1, Futaba radio, Trinity Pushed SCRs and an assortment of motors) puts him on the fast track. By combining various suspension and tire options (H-arms, five-link and Robinson front A-arms/Pro-Line red and Team Losi), Ryan, who lives in Fullerton, CA, can dial himself into the winners' circle!



THIS ONE'S REALLY HOT!

How devoted can you get?—not much more than Danny San Pedro "Readers' Rides," part of his room burst into flames, and they soon surrounded his car! Sensing an opportunity, he quickly grabbed his camera and shot the photo that you see here. Yes, his RC10 with its '69 Camaro Z28 body survived! For quick thinking in a crisis, Danny gets a *Car Action* subscription.

MONSTER TRUCK MANIA

It was inevitable that the two main trends in monster trucks would merge. Greg Beach of Genoa, IL, combined retro bodies and racing trucks into one creation. With a record six-for-six TQ's and five-for-six A-Main wins, Greg almost completely dominates his local track. To aid his efforts, Greg added a Hough Chassis, an MIP diff, a Tekin 700 ESC and a Futaba radio for control. When this photo was taken, he had just won the Byron Fest Race, and the truck still looks new! Good job, Greg!

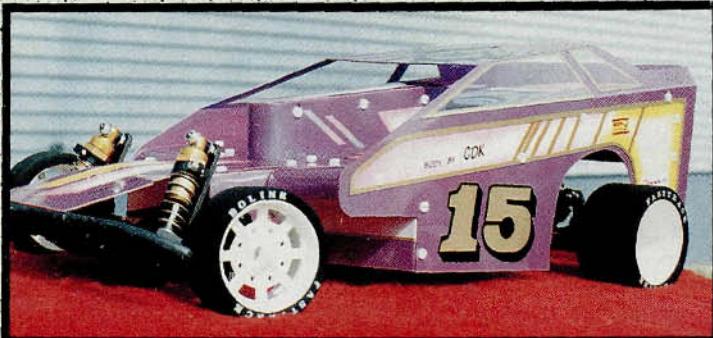
SLEDGE-O-MATIC

The Traxxas Sledgehammer (an ultimately underrated truck!) fell into the hands of Robert Dong (of Rockaway Park, NY) so be on the lookout! Last seen sporting a lowered Chevy body, the "Sledge-O-Matic" has been wreaking havoc everywhere! With a new battery location (under the chassis!) and a Novak T-4, the Sledge has been labeled "armed and dangerous"! Approach with caution!



OOH...BARRACUDA!

Jeff Johnson's (of West Fargo, ND) pride and joy is this replica of a Pro Street '70 Barracuda. The Hemi engine replica is entirely scratch-built from a pill bottle; remove the air cleaners, and you'll find the twin four-barrel carbs. Under the body, there's a basic 10L fiberglass chassis, but Jeff used a 12L rear pod to narrow the rear end so it would fit the mammoth rear tires. A set of Tecnacraft BBS gold-spoke rear wheels are shod with a set of Bolink Green Dot rears— $1\frac{1}{2}$ tires on each rim! With that much grip, holeshots are easy!



DIRT DEVIL

The Eastern Dirt Modified (or Mudbus) is one of the less popular forms of dirt-oval racing. Living in Endicott, NY, near the home of Dirt Modifieds, Charlie Danoski is an ardent fan, and he decided to make a replica racer. Very few quality Mudbus bodies are available, so he made one using sheet polycarbonate and nylon rivets. Charlie was inspired to make it perform like the full-size cars, so he added a multitude of hop-ups and made a mean go-left/steer-right machine!



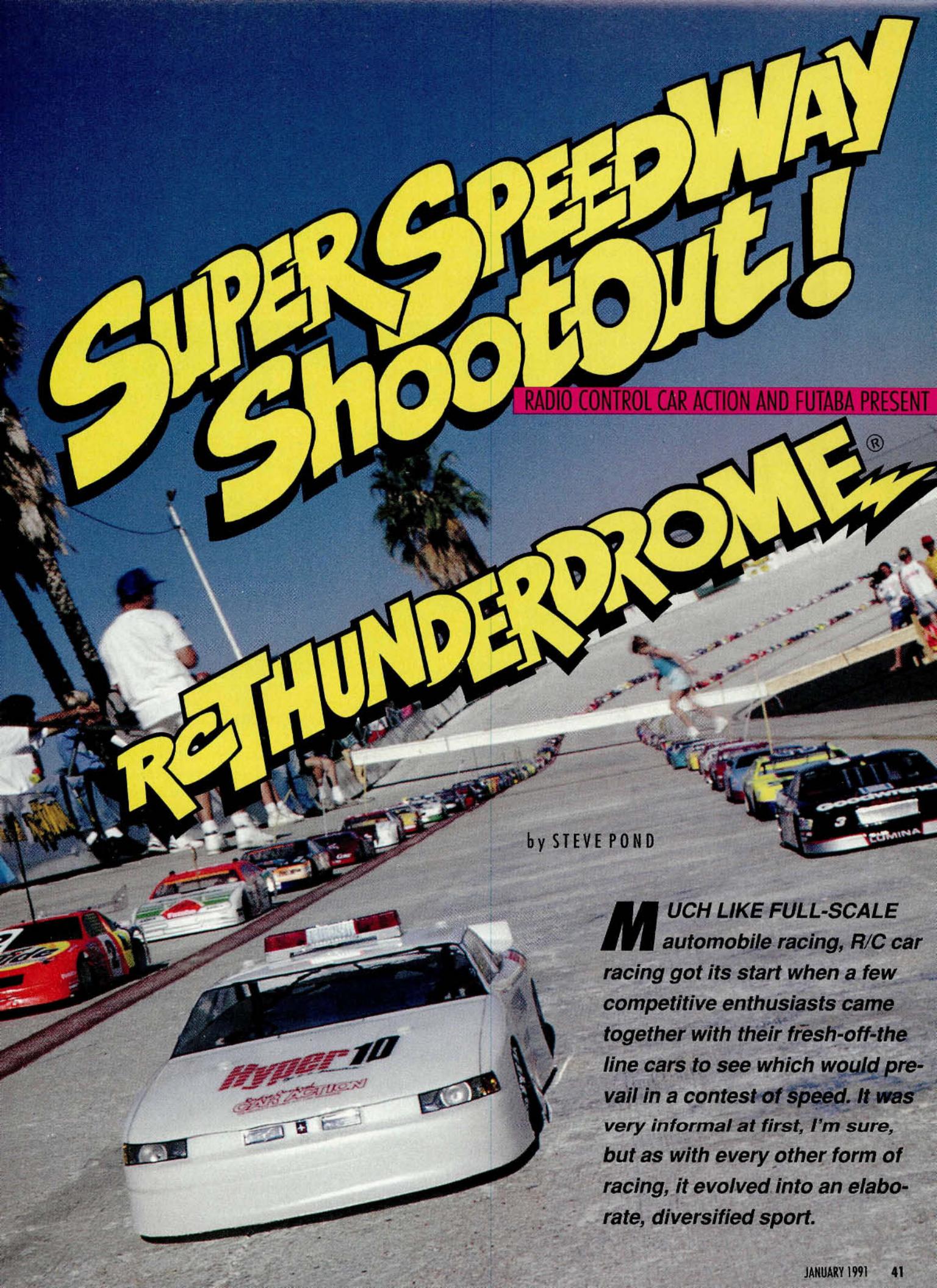
SUPER SPEEDWAY Shootout!

RADIO CONTROL CAR ACTION AND FUTABA PRESENT

Rc THUNDERDROME®

by STEVE POND

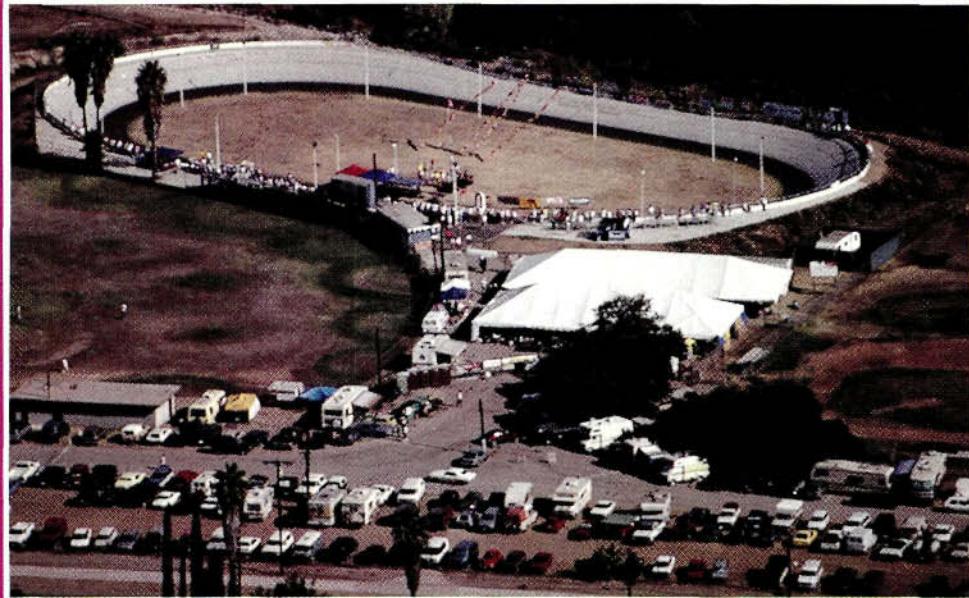
MUCH LIKE FULL-SCALE automobile racing, R/C car racing got its start when a few competitive enthusiasts came together with their fresh-off-the line cars to see which would prevail in a contest of speed. It was very informal at first, I'm sure, but as with every other form of racing, it evolved into an elaborate, diversified sport.



G U A R A N T E E D

Full-scale auto racing has had a substantial period in which to develop, and this has resulted in renowned races such as the Indy 500, Daytona 500, the 24 hours of Le Mans and many famous others. R/C racing, on the other hand, has had a comparatively short time to develop. Good use was obviously made of

Bud's Racing, Futaba, Bolink, Tekin Electronics, Novak Electronics, Hyperdrive, Braun Distributors, C&M, Cheetah Racing, Race Prep, Andy's, Cam Motors, Revtech Motors, B&R Motors, Dan's RC Stuff, McAllister Racing, Twinn-K, Pro Proven, Fantom Motors and Tecnacraft (forgive me if I missed anyone) competed



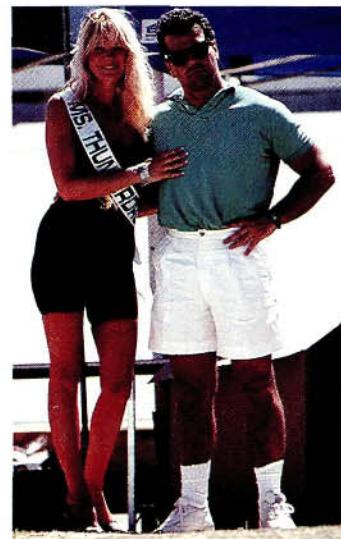
this time, because R/C racing has exploded to tremendous proportions.

Nineteen-ninety marked the third running of what has to be the most prestigious high-speed oval race R/C has to offer—the Superspeedway Shootout held at the famous Thunderdrome in Encino, CA.

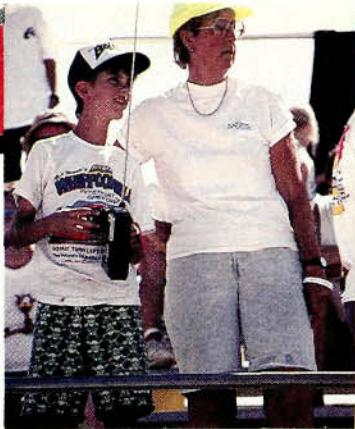
Organized by Dan Moynihan of Dan's RC Stuff and Gary McAllister of McAllister Racing, and sponsored by *Car Action* and Futaba, the Thunderdrome provided some of the most grueling competition ever in its three-year history. Teams from Associated Electrics/Reedy Motors, Trinity, TRC, CompositeCraft, Twister Motors,

for the coveted title of Thunderdrome Champion. They were also there to support their customers' racing efforts—hundreds of racers in the Amateur Stock and Modified Class 4-minute racing, which was sponsored by Futaba.

The entrants in the amateur class were greeted at the gate with a package that included a specially designed Thunderdrome T-shirt, a ceramic pin, a bumper sticker ("I survived the R/C Thunderdrome") and a set of four Days of Thunder model cars from Applause. Stock Class racers were also given a specially labeled Thunderdrome Stock motor.



Ms. Thunderdrome and RCCA Publisher Louis DeFrancesco were settled in the infield to greet the winners as the trophies were handed out.



S P E E D !

Bolink TQ Shootout

A-Main

		Laps	Time
1	Ralph Burch.....	Pro	14
2	Cliff Lett.....	Pro	14
3	Gary Hamilton.....	Am	13
4	Randy Moller.....	Am	13
5	Kent Clausen.....	Pro	11
6	Mike Boylan.....	Am	0

WHAT A TRACK!

Designed in the early '60s, the track is actually a bicycle-racing track. Its immense proportions include 15-degree banked straightaways that lead into 35-degree banked turns at either end. Standing at the bottom of the track, you stare up into the turns, which are as high as two-storey buildings. The banking seems so steep that you think your car might fall off it if you were bold enough to stop.

In the pits, crews had 120V AC power on hand to keep batteries freshly charged. Each of the cars ran a maximum of seven cells, which could be 1200 SCRs, 1700 SCEs, the new 1400 SCRs, or any of the other batteries considered legal by the two largest electric-racing organizations. On average, racers would have to make three or four pit stops for fresh batteries to complete the 14-minute heats.

DAY 1

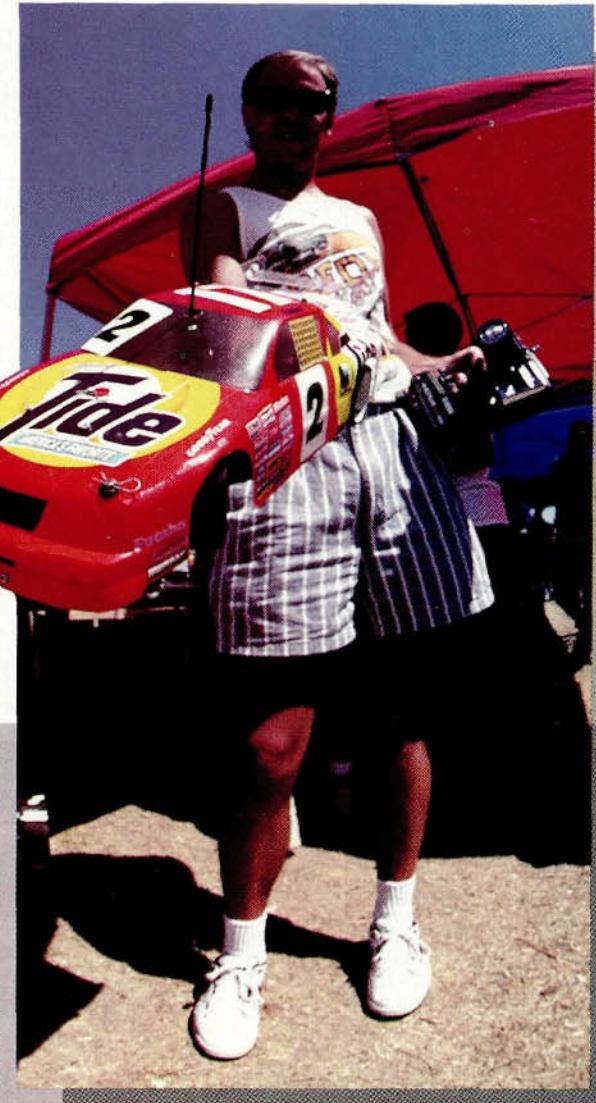
The racing schedule began in the morning on Friday, September 7, with the first round of Superspeedway qualifying, during which the Invitational drivers ran 14-minute heats. The drivers were permitted to have a spotter behind them on the drivers' stand to keep an eye on the massive 950-foot track for potential crashes.

Most of the racers used the first round to measure their performance against their competitors and to get their cars sorted out, and they immediately discovered the problems caused by the track surface's 150-degree,

The early leader of the A-Main, Ralph Burch Jr., yields to Kent Clausen, who finished the race as the 1990 Thunderdrome Champion.



Clausen gave everyone a good look at his Tide machine before leaving 'em in the dust.





heat-wave temperature.

Tires, which were tortured by the extremely high speeds and temperatures, took the hardest punishment. The TRC Radials were handicapped by the heat on this track, which requires durability rather than high traction. Triad drivers ended up using Twinn-K tires with thicker rubber caps and, apparently, a stronger bond between the foam and rubber. Joel Johnson and others even managed to peel off some of those caps when the foam separated from the wheel. At the speeds the faster cars were traveling (the tires were turning at approximately 140 rotations per second), it proved to be tough on just about every tire.

Motors were also a problem for some, because the heat and high speeds caused a few electrical meltdowns. Having a motor that was too hot proved to be fatal with the extreme heat, and the smell of electrical fires trailed the cars that were running strong early in the race. It was evident that it was better to go mild than wild with the motor and gearing and to finish the race instead of going up in flames.

As the Invitational racers headed for the pits to prepare for the second round of qualifying, the Amateur Class drivers competing for the Futaba Challenge honors, had a 2-hour round of practice to get their cars sorted out for their first round of qualifying at the end of the day.

The Amateur Class drivers went by many of the same



rules as the Invitational Class as far as their cars were concerned, but these cars were limited to running 6-cell packs, which were in the car for the duration of the 4-minute heats. Because the cars were limited to six cells instead of seven, speeds were more controllable and therefore easier on the equipment.

Tires weren't as much of a problem in this class, but speeds were high enough to cause some of the same problems with aerodynamics that the Invitational drivers experienced. A delicate balance of body and wing was necessary for proper handling. Too much wing caused cars to push into the turns, while not enough wing caused their rears to slide out on occasion.

Having learned a little from the first round of qualifying, the Invitational drivers set out for the second round. It was evident at this point that the traditional methods of setting-up a car with tweak and tires wouldn't make the cut.

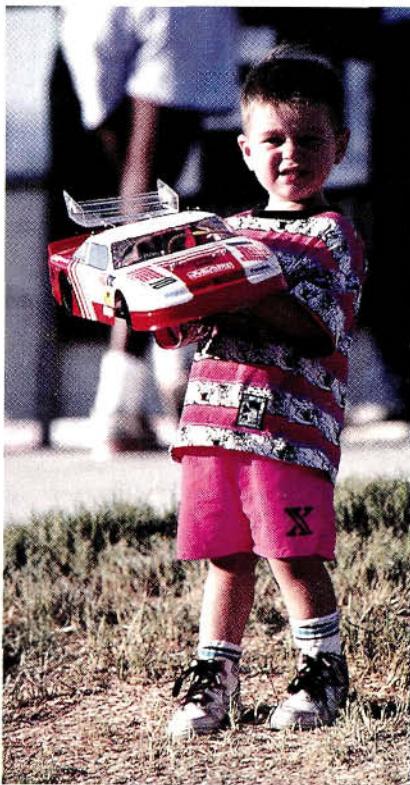
Even team drivers couldn't figure out where Lett found the determination to pilot his car around the track at blistering speeds to win the Insane Speed Run, but when he was presented with the trophy, the pieces began to fall together....



Parma Days of Thunder Celebrity Race

A-Main

	Laps	Time
1.....Paret Greene, spectator	12	4:0.97
2.....Doug Kott, Road & Track	11	4:12.04
3.....Will Hansel, Circle Track	10	3:59.76
4.....Jeff Vetraino, Auto Week	10	4:10.01
5.....Dan Moynihan, Dan's RC Stuff	9	4:31.15
6.....Larry Warren, Stock Car Racing	8	4:7.91
7.....Shon Doyle, spectator	7	3:24.05
8.....Mike Kanke, Stock Car Driver	5	4:5.16
9.....Jeff Smith, Hot Rod	3	2:15.02
10.....Craig Fisher, On Track	0	



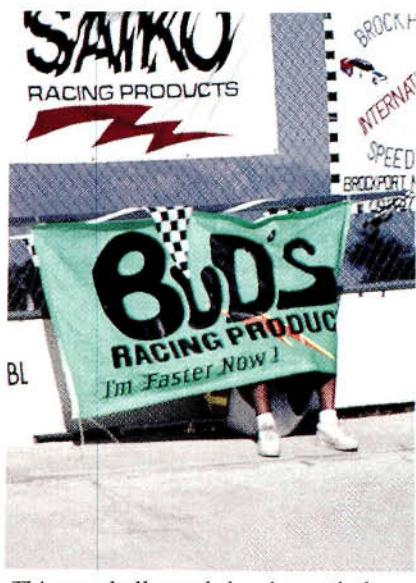
Speeds of over 60mph brought a number of other elements into play, the biggest of which was aerodynamics. Proper tweak was essential for handling and tire wear, and tire-compound selection was critical, too, but many drivers had never been up against what cutting through the air at speeds of over 60mph can do to a car.

Bodies were trimmed more precisely; some wings were narrowed with less angle to minimize drag; and some were even using makeshift front spoilers made of electrical tape to keep their noses as close as possible to the ground while allowing flexing when the nose came close to the racing surface!

The field of pros began to sort itself out as Team Associated's Kent Clausen, the winner of the first Thunderdrome, set the pace with his Reedy-powered 10L superspeedway car. Bringing with him the benefit of two previous years on the Thunderdrome, Clausen opted to run with the less powerful SCE batteries. The SCEs provide a lower voltage than the SCRs, and this limits speeds, but it proved to be just right with the Reedy 12-turn motor as Clausen was able to finish the qualifiers with only three pit stops, still running strongly at the end.

Other impressive performances were turned in by Cliff Lett, also of Team Associated, in his first visit to the Thunderdrome. Ralph Burch Jr., last year's champion, also turned in a solid run, driving the newest version of the Hyper 10. Ralph's Hyper 10 was powered by CAM Motors and Hyperdrive batteries.

The second round of amateur qualifying finished the racing schedule for Friday with some of the highlights in the Modified Class being Randy Moller driving a C&M Cobra, Mike Boylan with a scratch-built car, and

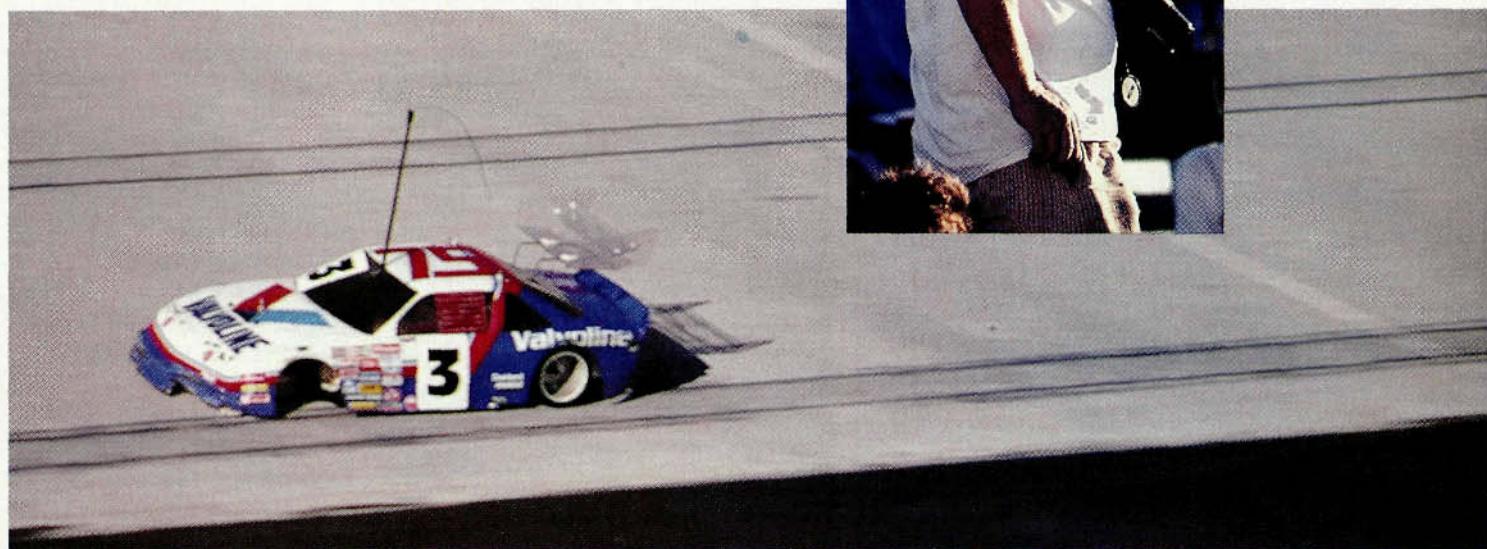
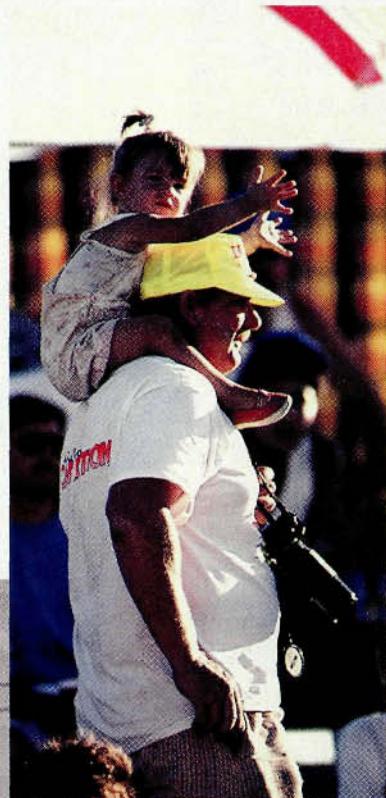


This marshall crawled underneath the Bud's banner to hide from the burning sun and 100-degree weather,





Far left: Win or lose, after running 25 miles, drivers in the A-Main Superspeedway Class were glad to put their transmitters down!



Early in the Superspeedway A-Main, Bob Novak lost his left front wheel in a crash, but he continued for the duration of the event. This earned him the title of "Tripod Bob."



Left: Car Action Publisher Louis DeFrancesco and Gene Hustings of Team Associated enjoy the high-speed racing from the infield of the Thunderdrome.



Kent Clausen and his pit crew enjoy the fruits of victory: Ms. Thunderdrome—Cristy Mitchell—passes out the trophies.

Gary Hamilton with his 10L and Cheetah narrowed rear end.

DAY 2

The Saturday program started with the second round of amateur qualifying, followed by the third and final qualifying round for the Invitational Class. It finished with the final round for the amateurs. When the last qualifier had been run, there was a bonus for the many spectators and racers: the Insane Speed Run.

In the Stock Class, Jordan Carpenter took the top honors with his 10L; Don Winans took 2nd with his hybrid 10L, and Bill Ranier took 3rd with his OM 10. For the Modified Class, Randy Moller was in the top spot with his Cobra-powered C&M Cobra car; Gary Hamilton took 2nd with his Revtech-powered Cheetah/10L; and in the 3rd spot was Mike Boylan driving his Twister-powered scratch-built car.

The Road Wizard Class, in which competitors run the popular Tamiya 1/10-scale Road Wizard Formula 1-type cars, was limited to one heat, but the competition was just as tough. Jim Kimura pulled off a solid TQ run ahead of the favorite and previous champion Hobie Kaptan, which set the stage for the A-Main.

After the shuffle was over, as racers attempted to get a look at the final qualifying sheets to find their qualifying positions, the track was cleared for the Insane Speed Run.

INSANE SPEED RUN

The Insane Speed Run is a no-holds-barred competition of speed in which competitors are allowed to run any car,

motor(s) and as many cells as they wish, in an attempt to run a faster lap than any electric-powered R/C car in the world on a closed course in 1 minute.

Though the trophy would go the fastest average speed in the 1-minute period, many drivers had their sights set on running the fastest lap, which was set last year by Kent Clausen at 70.1mph! One at a time, cars set out for their runs, and it soon became evident that adding 10mph to their speeds was much more difficult than they had thought. There were smoking motors and batteries for those who were fortunate enough to finish the run, but for many, a date with the unforgiving outer wall ended their evening.

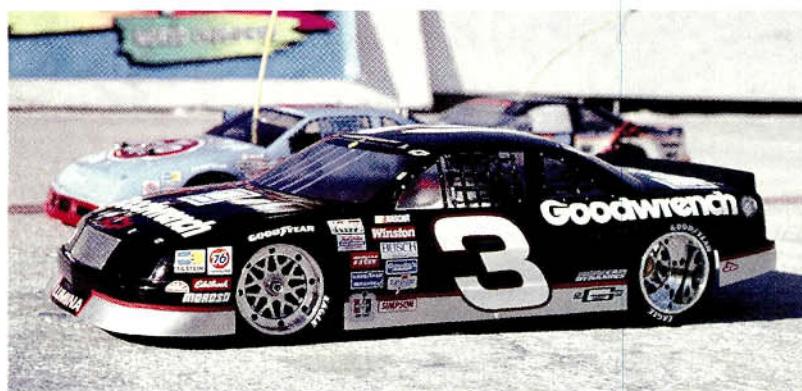
Many cars ran in the 65+mph range, but breaking the magical 70mph barrier would have to be done with just the right power



Team Associated swept the Invitational Class when Kent Clausen (left) won the Superspeedway A-Main and Cliff Lett (right) won the Insane Speed Run.

Insane Speed Run

	Av. Speed
1 Cliff Lett	66.3
2 Mike Garrett	61.7
3 Ken Moon	60.1
4 Andy Dobson	53.8
5 Dave Pulfer	53.6
6 Rick Jordan	51.7
7 Mike Dunn	51.4
8 Bryan Blaser	50.9
9 Don Rice	50.7
10 ... Snuffy Smith	49.5



Doug Warneke took 1st place in Modified Concours with this beauty.

combination. This year marked the first time twin-motor cars entered the field, and though they were a definite threat, it was anyone's guess as to how fast they'd be able to go.

The most serious threat to the record came from Joel Johnson of Team Triad when he showed up on the track with a custom-built, twin-motor Custom Works Dominator. Sponsored by Tecnacraft, this monster Dominator featured (among other things) a custom-made chassis with a pair of hot-wind motors and a sizzling 20½ sub-C-cell pack for power. Each motor took care of powering one end of the car, while a Tekin 700 speed controller regulated the juice.

After a few unsuccessful practice runs with the car, there was some speculation about whether or not Johnson would be able to hold the beast on the track. It was decided that spectators should be cleared from above the track in the turns after

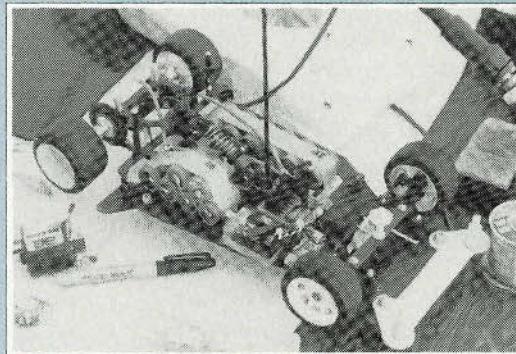
Joel's car almost went through the wooden barriers on a test run. The speeds were blistering enough to blow the record wide open, but as fate would have it, there proved to be too much horsepower for the car to handle as it limped down the back straight (with a broken chain on the rear end) before it could break the timing tower for a hot lap.

Phil Simms even gave it the old baseball try with his Hough Illusion dragster (I told you anything goes!). Under normal circumstances, these dragsters have all the ingredients necessary to go well over 70mph, but its performance on a banked track remained to be seen. With only a pair of wider front tires attached to the car, Simms set out on his 1-minute run.

What started out as a promising run fell apart when the long-wheelbase machine began to lose traction in the turns and the rear swung

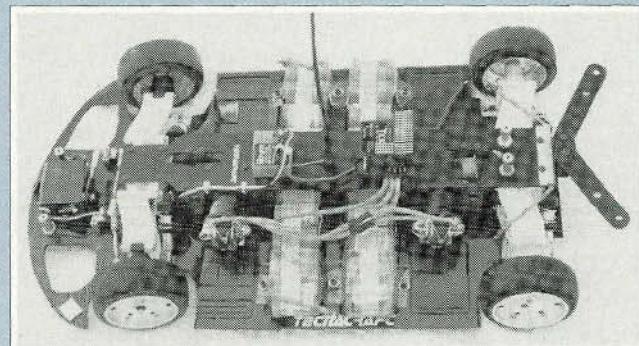
One Thunderdrome race stands out as the most popular with spectators. The 4-minute heats and the Superspeedway racing provide some great competition, but the fence hangers really come out of the woodwork for the Insane Speed Run.

For one minute, each of the competitors runs solo in an attempt to turn the fastest possible laps. Overall speed is what counts, but the



Cliff Lett's winning car was a standard 10L Superspeedway with 12 cells and a single motor.

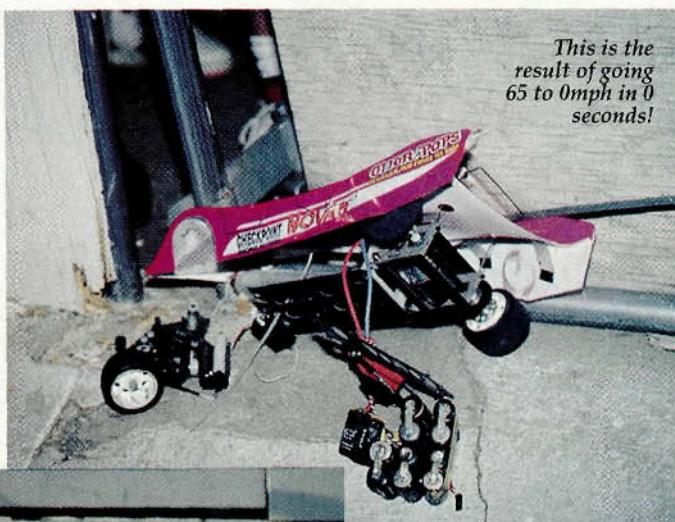
LOCO-MOTION?



Joel Johnson's Dominator was very impressive. Unfortunately, its chain drives couldn't handle its horsepower.

fastest single lap is what drivers are really gunning for.

This year's competition brought out some of the most formidable custom-made R/C speed machines ever seen, the most exciting of which was Joel Johnson's 4WD monster. This was the first twin-motor car to make a serious attempt



Left: The "Bud" of Bud's Racing Products is interviewed by NBC TV for a piece that aired on the sports telecast a few days after the event.



Right: The Thunderdrome not only offered people a great time; they also took home bumper stickers, hatpins, and four miniature "Days of Thunder" cars from Applause. Stock-Class entrants took home a motor, too.



Amateur Modified A-Main

Fin	Qual	Name	Laps	Chassis
1	3	Mike Boylan	20	Scratch-built
2	1	Randy Moller	20	C&M Cobra LTOOR
3	2	Gary Hamilton	20	10L/Cheetah NRE
4	5	Roger Vorba	19	Bolink Eliminator
5	6	Craig Markle	19	Bolink LTO
6	7	Brian Howler	19	Bolink Eliminator
7	10	John Jenkins	18	Bolink LTO
8	8	Roy Powell	15	Assoc. 10L
9	4	Cliff Rose	13	Hyper 10
10	9	Tyler Clements	0	Assoc. 10L

Amateur Stock A-Main

1	3	Bill Ranier	19	OM 10
2	5	Jim Collins	18	CompCraft Lynx II
3	1	Jordan Carpenter	18	Assoc. 10L
4	10	Steve Fenimore	18	Thunder
5	9	Eric Steenhoven	17	Assoc. 10L
6	4	Michael Cat	17	Assoc. 10L
7	6	Larry Pipp	17	Assoc. 10L
8	2	Don Winans	16	10L hybrid
9	8	Jim Valentine	13	Assoc. 10L
10	7	Brent Braun	9	Scratch-built

Pro Superspeedway A-Main

1		Kent Clausen	140	Assoc. 10L
2		Phil Simms	139	Bolink LTO
3		Bob Novak	130	Assoc. 10L
4		Don Rice	125	Bolink Enduro
5		Ken Moon	118	Assoc. 10L
6		Dave Pulfer	115	McAllister MX-Pro
7		Cliff Lett	114	Assoc. 10L
8		Bud Bartos	112	Hyper 10
9		Rick Jordan	97	Bolink Enduro
10		Ralph Burch	31	Hyper 10

at breaking the record; it also had a custom-made chassis and up to 20 cells for power.

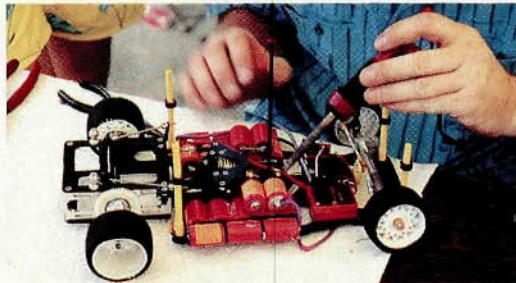
Johnson ran a twin-motor Custom Works Dominator sponsored by Trinity and Tecnacraft. It was a tremendous threat, but when it was time to put the ponies to the ground, the chains connecting the motors to the diffs let go, and this ended Johnson's run before a hot lap could be recorded.

Andy Dobson's custom Lynx II featured a custom rear pod with twin motors, but this design never got off the ground because it stripped its spur gear before even reaching full speed. Defending record holder Kent Clausen of Team Associated stayed with a single-motor setup in a narrow 10L and managed to turn some very hot laps, but not more than the magic 70.1 mph. Cliff Lett (Clausen's teammate) eventually took top honors with a narrow 10L, but the record still stands!

If this year's specially designed speed cars are any indication of what's to come in '91, there's a good chance the record will fall—by how much is anyone's guess.



Left: One Stop Raceway set up a temporary shop at the Thunderdrome, keeping racers well supplied with parts. Below left: Dobson's custom-made Lynx II Speed Run car couldn't take another cell, even if he tried! Despite a valiant effort, he couldn't keep it running long enough to be a threat. Below: Gary McAllister and Dan Moynihan present Publisher Louis DeFrancesco with a sponsorship trophy.



around like a hockey stick. The result was that Simms couldn't put together a strong enough lap to take the honors, but he went home with a car that was in one piece, which I guess is half the battle.

Snuffy Smith of Hyperdrive managed to squeak into the number 10 spot with an

average speed of 49.5 mph, which is usually nothing to write home about, but he did it with a transmission car! To a Hyperdrive on-road Ultima conversion, Snuffy attached a Hyperdrive conversion on a stock Ultima transmission and went for broke. I don't know if there are any

Motor	ESC	Tires	Batteries	Body	Sponsors
Twister	Novak 410 MKc	Twinn-K	Team Smooth	Assoc. Lumina	Braun/Twister/Winners Circle/Twinn-K
Cobra	Tekin 411	Twinn-K	Ballistic	Andy's Pontiac	C&M/Tekin/Twinn-K/Scat
Revtech	Tekin 700	HPI	Revtech	Assoc. Lumina	Revtech/Cheetah/Tekin/HPI/T&A
Revtech	n/a	Bolink T/M	Revtech	Bolink TBird	Revtech/Bolink/Autographics/Cheetah/Bowlers Lodge
CAM	Tekin 700	Bolink T/M	PTI	Bolink TBird	CAM/Bolink
Revtech	Tekin 700	Bolink T/M	Revtech	Bolink TBird	Bolink/Revtech/Tekin
Revtech	Novak T1X	Bolink T/M	PTI	Bolink TBird	Bolink/Revtech/Dan's/Futaba/PTI
Twister	Jay Man	Twinn-K	Quantum	MRP Lumina	wanted
CAM	Tekin 700	WideTrack/TRC	PTI	Bolink Lumina	Hyperdrive/CAM/K&G Hobbies/PTI
Twister	Novak 410 MKc	TRC	Team Smooth	Assoc. TBird	Twister/Novak/Track Master/Dan's

T	Tekin 700	CKW	Power Cells	Bolink Pontiac	Power Cells/Tekin/CKW
-	Tekin 600	TRC	Sanyo	Bolink TBird	none
D	Tekin 600	Twinn-K	Quantum	Bolink Olds	Quantum
R H	Tekin 610	CKW	Team Arlington	McAllister Pontiac	Futaba/Thundercars/T&A/McAllister
O A	Tekin 700	CKW	CKW	Bolink TBird	CKW
M N	Jay Man	Scratch-built	Sanyo	Andy's Lumina	none
E D	Novak 410 MXc	CKW	Pro Fab	Andy's Camaro	McDonalds/Pro Fab
O	Tekin 600	CKW	Trinity	MRP Camaro	none
U	Tekin 700	TRC	Pro Fab	Bolink Lumina	Pro Fab/McDonalds/SLO Hobbies
T	Tekin 411	TRC	PTI	Bolink TBird	Braun Hobby/Mad Dog/CAM/PTI

Reedy	Novak 410 MXc	TRC	Reedy	Assoc. Lumina	Assoc./Reedy/Lavco/Novak/Futaba
CAM	Novak 410 MXc	TRC	CAM	Bolink TBird	Pro Proven/CAM/Bolink/Houge
Reedy	Novak 410 MXc	TRC	Reedy	Assoc. Lumina	Novak
Fantom	n/a	TRC	Power Push	Bolink TBird	Futaba
B&R	Tekin 700	Twinn-K	B&R/Stealth	McAllister Olds	B&R
Wimpy	Tekin 600	Twinn-K	Gonzo	McAllister TBird	McAllister/Wimpy/Gonzo/Twinn-K/Dan's
Reedy	Novak 410 MXc	TRC	Reedy	Assoc. Lumina	Assoc./Reedy/Novak/Airtronics/RCPS
Bud's	Tekin 700	Twinn-K	Power Push	Bolink Pontiac	Bud's Racing Products
CAM	Novak T1X	Bolink T/M	PTI	Bolink Pontiac	Bolink/CAM/PTI
CAM	Novak 410 MXc	Wide Track	Hyperdrive	Bolink Lumina	Hyperdrive/Futaba/Novak/CAM

THUNDERDROME

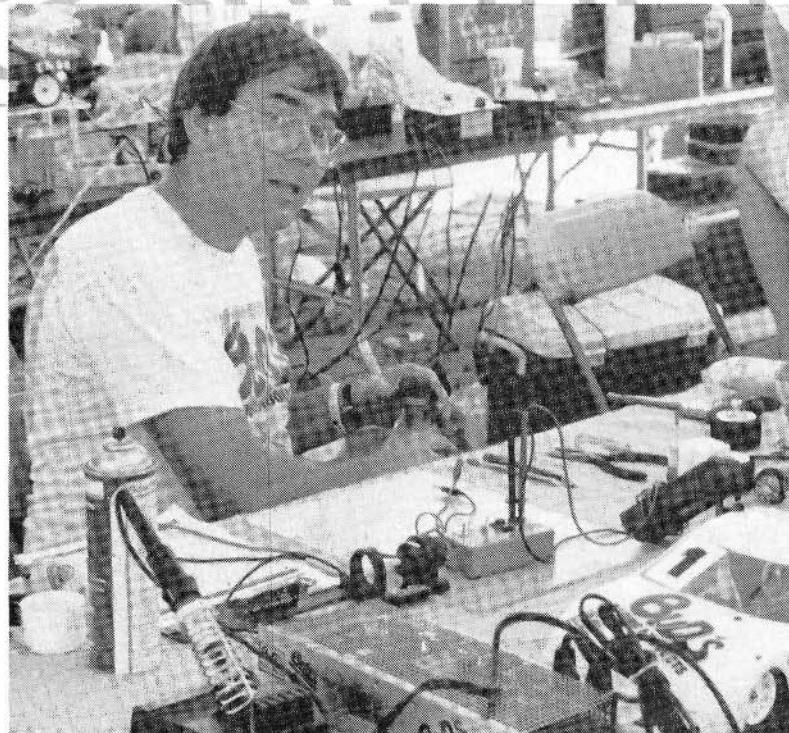
records standing for the fastest transmission car, but this would be a tough mark to beat if there was.

Another notable performance came from Rick Jordan of Bolink who took the 6th spot in the speed run with an average speed of 51.7mph, which, under normal circumstances, isn't anything to rage about, unless that is, you consider he did it with a box-stock Bolink Eliminator Sport—a \$90 car!

When the smoke had settled, the threatening twin-motor cars hadn't been able to put enough consistent laps together to get over 70, and a Reedy-powered (yes, only one motor) 10L took the honors once again—but it wasn't driven by Kent Clausen! Cliff Lett, running the new superspeedway version of the 10L with a narrowed GTP body, wound up turning the fastest lap, and ultimately the fastest overall speed, but the record set by Kent Clausen stood at 70.1mph when the best Lett could muster was a 69.6mph lap. Not one to go down without a fight, Clausen arranged a "grudge match" with Lett to settle the team's score. He did win, but the honors still went to Lett as the fastest driver of the 1990 Thunderdrome.

THE FINAL DAY

Sunday, the final day of the Thunderdrome, started with the opening ceremonies at 9 a.m., in which all the competitors set their cars on the track for the concours competition. I had the privilege of watching the concours judging from the *Car Action* helicopter at 1,000 feet, from which the pack of cars looked like an



Bud Bartos is caught taking a swig of Gatorade! When asked if this is the secret of his driving success, he shrugged and said it's his favorite drink. Inside sources say the additional dose of green he gets from the drink's lime flavor sharpens his skills.

army of ants. Those on the ground saw some rather sharp-looking cars.

Leading the two rows of cars that stretched the entire length of the straightaway and part of the way through turn four, was the Hyperdrive pace car built by Snuffy Smith—a position of honor that's given only to the previous year's winner.

SOMETHING SPECIAL

At the conclusion of concours judging, the track was cleared for two special races before the regular program. The first race was sponsored by Parma and was for celebrities representing full-scale car magazines at the Thunderdrome. The second was the Bolink TQ Shootout, in which the three top qualifiers in both the Invitational Class and the Modified Amateur Class were pitted against one another running six, identically prepared, Bolink Eliminator Sport, 1/10-scale, on-road cars.

When the celebrity races ended, the drivers went back to the pits to prepare for the day ahead and the finals of the 1990 Thunderdrome.

THE MAIN EVENTS

The Mains started with the amateurs who, even in the lower Mains, managed to make the best of their weekend by putting forth their best efforts, regardless of the letter attached to their race.

The Road Wizards came first, ahead of the Pro Super Speedway run, which was dominated by Bob Sarnelle with the only 19-lap run, about 12 seconds ahead of the 2nd-place finisher and TQ, Jim Kimura. Five seconds behind Kimura on the same

(Continued on page 98)

Before starting the regular program on the final day of the Thunderdrome, the event's organizers arranged to have two celebrity heats to demonstrate the lighter side of racing and having fun.

The first race was sponsored by Parma for the attending celebrities from many of the full-scale-car magazines. These magazines were represented: *Hot Rod* (Jeff Smith); *Road & Track* (Doug Kott); *Stock Car Racing* (Larry Wollen); *Circle Track* (Will Hansel); *Stock Car Driver* (Mike Kanke); and

Auto Week (Jeff Vettraino). Filling out the 10-car field were Paret Greene and Shon Doyle (spectators) and Dan Moynihan of Dan's R/C Stuff.

The drivers were given equal Parma "Days Of Thunder" stock cars, each painted to resemble one of the cars that appear in the movie, and the action was nothing short of what viewers see on movie screens. Spectator Paret Greene managed to pull off the win, but the Doug Kott of

Road & Track was the top finisher among the celebrities. He was followed by Will Hansel of *Circle Track* and

ning identically prepared, Bolink Eliminator Sport, 1/10-scale, on-road cars. Ralph Burch took the top honors

SIZZLING CELEBRITIES!

Jeff Vettraino of *Auto Week*.

The second of the special races was the Bolink TQ Shootout in which the three top qualifiers in both the Invitational Class and the Modified Amateur Class were pitted against one another running

with Cliff Lett 8 seconds behind. The highest finishing amateur was Gary Hamilton in 3rd, ahead of Randy Moller, Kent Clausen and Mike Boylan, who finished in that order. Congratulations to all!

TRUCK STOP

by DAVE SPROUL

NR/CTPA MIDWEST NATIONALS

WELCOME to another edition of "Truck Stop"! This month, I'll cover the NR/CTPA Midwest Nationals that were held in Fort Wayne, IN, and I'll also tell you about some new truck products. The River City Pullers of Ft. Wayne and Event Director Bill Niccum hosted the 1990 NR/CTPA



Big Boss body mounted on Kyosho's USA-1 chassis looks as massive as its full-scale counterpart, which was also on display. This truck placed 2nd in Monster Course competition and 3rd in Concours.

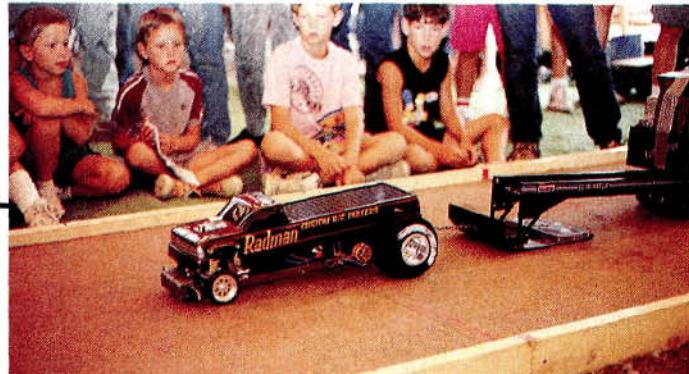
Midwest Nationals on July 21 to 22. Attendance was good; of the 142 entries, 125 were pullers and 17 were monster course contenders. Contestants traveled from all over the U.S., and the long-distance award went to Larry Gorden of San Jose, CA. Also present were manufacturers' representatives from AJ's R/C*, Bennett Equipment*, Black Magic Motors*, Custom R/C Pullers*, Kyosho*, Parma International* and Zeta* speed controllers. The Kyosho-sponsored, full-size, Big Boss monster truck made an appearance, but it didn't run, because the event was held at the

Allen County 4-H Fair, and officials were afraid that it would scare the animals. This was

disappointing, since a monster truck is much more impressive when you hear it run!

There were so many good-looking trucks and tractors in the Concours competition that it was difficult for the judges to choose the best. Coming out on top in the puller division was David Martin (Clemmons, NC), who designed and molded a '34 Sedan Delivery body and mounted it on a scratch-built chassis. Second prize went to John McNamara (Freedom, PA) for his incredibly detailed, 6-wheel Clod Buster, and in the third spot was Don Hubert (Champaign, IL) with a '57 Chevy body (complete with detailed interior) mounted on a Big Bear. Clinching the "Most Realistic Puller" award was a stretched, lowered, modified Clod Buster owned by Kelley Harris (Waukesha, WI).

The Monster Concours was just as tough. John Burger (Monte-lier, OH) captured the 1st place in the Concours and the "Most Realistic Monster Truck" award with his Clod Buster, which was a detailed replica of the full-size "Ex-



Custom R/C Puller "Radman" on its way to a 5th-place finish in the 2WD Open II.



Concours entries were plentiful and beautiful! Six-wheel Clod Buster took 2nd-place honors in pulling category. Truck was built by John McNamara of Freedom, PA.

caliber" monster truck. Locking-up 2nd place was Don Hubert (Champaign, IL), again with a Big Bear; and 3rd went to John Stokes (Tuscola, IL) with a Kyosho USA-1 chassis fitted with a Big Boss body.

The Concours was tough, but the pulling competition was fierce. Several places were decided by as little as $\frac{1}{4}$ inch! Many scratch-built trucks and production pulling machines competed with the usual mixture of production monster trucks. (I didn't have room to name all the winners, so I've listed 1st through 5th place in each class. (See sidebar.) There weren't too

many surprises, except in the 2WD Modified Class: a Grasshopper out-pulled the Black-foots and the Big Brutes to win! The Clod Busters dominated the Dual-Motor Stock and Modified

Classes—no surprise there! There was a trial class—the 2WD Sportsman—for scratch-built and production pulling trucks using stock -



A very nice, stretched Clod Buster body on a puller chassis. Check out the airbrush mural on the bed cover!



Heavy rain on Saturday night and early Sunday morning flooded parts of the tent and made this impromptu "Mud Run" possible.

WINNERS

2WD STOCK

Place	Name
1	Larry Gorden
2	Jim Bee
3	Mark Fernando
4	Micah Martin

2WD SUPER STOCK

Place	Name
1	Mark Fernando
2	Debbie Sanders
3	Bill Gabbard
4	Kevin Florence
5	Fred Kanney

2WD MODIFIED

Place	Name
1	Al Janicki
2	Tim Toma
3	Roger Maynard
4	Chad Ellis
5	Larry Gorden

2WD OPEN I

Place	Name
1	Larry Bennett
2	Dave Dornbusch
3	Jim Bee
4	Mark McFadden
5	Joe Kirkwood

2WD OPEN I

Place	Name
1	Jim Bee
2	Tim Fry
3	Larry Bennett
4	Greg Kinsey
5	Don Fisher

4WD STOCK

Place	Name
1	Pat Bradley

4WD SUPER STOCK

Place	Name
1	John Burger
2	Bud Woodruff

4WD OPEN I

Place	Name
1	Stevie McDonald
2	AJ's R/C

4WD OPEN II

Place	Name
1	Larry Bennett
2	Mark McFadden
3	Dale Arman
4	John Haseldon
5	John McNamara

DUAL MOTOR STOCK

Place	Name
1	Roy Allen Jr.
2	Dale Arman
3	Todd Eckelberg
4	James McMasters
5	Matt Wilkins

DUAL MOTOR MODIFIED

Place	Name
1	Brian Gallagher
2	Doug Howard
3	Rob Choinski
4	Dan Carlisle
5	Roger Vanderventer

2WD SPORTSMAN

Place	Name
1	James McMasters
2	Steve Van Dyke
3	Joe Haynes
4	Chad Whitacre
5	Kelley Harris

MONSTER COURSE RACE

Place	Name
1	Don Hubert

CLASS - 2WD SUPER STOCK

Place	Name
1	Scott Edgerton
2	Allan Hood
3	Kevin Florence
4	Chad Ellis
5	Brian Naliker

4WD STOCK

Place	Name
1	Joe Kirkwood
2	John Stokes
3	Gerry Johnson
4	John Burger
5	Weston Hartley

4WD MODIFIED

Place	Name
1	Chris Manns

OPEN

Place	Name
1	Mike Dozier
2	Gerry Johnson
3	Mike Shaw

CONCOURS - PULLER

Place	Name
1	Dave Martin
2	John McNamara
3	Don Hubert
4	"Most Realistic Puller"
	Kelley Harris

CONCOURS - MONSTER

Place	Name
1	John Burger
2	Don Hubert
3	John Stokes
4	"Most Realistic Monster"
	John Burger

motors, 7-cell batteries and weighing no more than 10 pounds. This was very popular as a low-cost, entry-level class, and the competition was as tight as in the open classes.

The monster truck competition was set up drag-race style with two, identical, straight-line obstacle courses. The track was only 40 feet, but since there were no track marshalls, it was important to take the time to make a clean run. If you rolled over, you were finished! In each race, two trucks ran side by side, but they were only competing against the clock, and the fastest time in each class was the winner. Representatives from AJ's R/C were on hand to set up and operate their drag-race timing system, and they did an excellent job! Despite some rain on the second day, the event went very well. Congratulations to all the winners!

NEW TRUCK PRODUCTS

AstroFlight* has a new electronic speed controller—model no. 205 is rated at 100 amps continuous, 800 amps surge, and it can handle 32 cells. The unit looks very strong, and it has already been tested in competition. (Its retail price is \$199.99.)

Performance Pulling Products* is a new company that manufactures pulling parts, gears, 2WD chassis kits and pulling sleds. It looks like high-quality stuff and, since the owners are pullers themselves, you can be sure it has been tested! For more information about their products, send for a brochure.

I've seen the prototype for Sassy Chassis'* new aluminum chassis kit for the Kyosho USA-1. Rumor is that it will include a heavy-duty bellcrank steering system and that its price will be similar to that of the popular Sassy Chassis for the Clod Buster. Watch for the release of this hot new item!

In the last "Truck Stop," I talked about detailing the Parma Hemi Engine kit. Unfortunately, the address for MSC Products* was omitted, so I've included it this time. Well, that's all for now. Until next time, happy pulling!

*Here are the addresses of the manufacturers mentioned in this article:
 AJ's R/C, 2102 Guilderland Ave., Schenectady, NY 12306.
 Bennett Equipment, 900 East 1300 South, Romney, IN 47981.
 Black Magic, R/C Research Eng., 7517 10th St., Stanwood, MI 49346.
 Custom R/C Pullers, 20 Dobson Rd., Mars, PA 16046.
 Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.
 Parma International, 13927 Progress Pkwy., N. Royalton, OH 44133.
 Zeta; distributed by Product Design, Inc., 16922 N.E. 124 St., Redmond, WA 98052.
 AstroFlight, 13311 Beach Ave., Marina Del Rey, CA 90292.
 Performance Pulling Products, R/C Hobbies and Raceways, 2949 Hartford Ave., Johnston, RI 02919.
 Sassy Chassis, 204 South Oak St., Itasca, IL 60143.
 MSC Model Products, 22 South Balsam St., Lakewood, CO 80226.

HOME-BUILT PROJECT:



by DEMETRIOS MATTES

IT ALL STARTED for me a few summers ago with a "Big Bubba" and a "Lobo" (my first R/C vehicles). But after the crashing and thrashing, all they were good for was trashing! I gave my neighbor a ride to the local hobby store so he could buy parts for his Blackfoot and (with a little persuasion from him and my son), I found myself walking out with a Clod Buster, a radio and a battery charger!



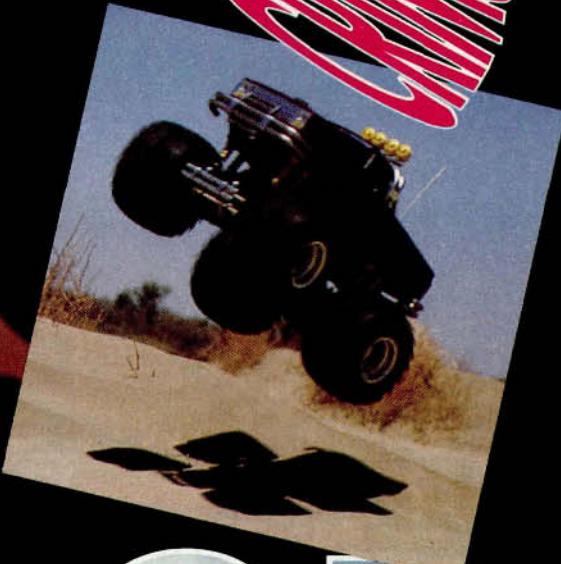
CRAB

MOD CLOD CHANGES

The first things that just had to be changed on the Clod were its shocks. Off came the old, spring-damped red ones, and on went the Tamiya long, yellow, oil-filled shocks. Because the yellow shocks were shorter, I made a lift kit for them and moved the forward steering arm from the top of the servo-saver arm to its bottom.*

I replaced all the stock steering-ball ends with heavy-duty Pro-Line ends and 4-40 rods.*

ANONCRUSHER



ANON' CLOD

After that, I was able to trim the rubber stops on the shock shafts to increase travel on the axles without raising the chassis. The next items that had to go were the stock 540 motors. I replaced them with a set of Kyosho* LeMans 480 Gs, which are fully advanced and synchronized for maximum power output. Plastic bushings slow things down, so I replaced them with a set of DuraTrax* stainless-steel ball bearings.

ACCESSORIZE!

After seeing all the beautifully detailed, customized cars and trucks in the *Car Action* mag, I just couldn't stop there! At the time, the Clod was still new to the market, and we couldn't buy any custom accessories "off the shelf." It's my nature to tinker, so I had no problem making all the necessary parts myself.

I thought that working lights for the roll bar and headlights would really look good, but something also had to be done about the roll bar itself—it was plastic! The headlights were easy (I used a

Tamiya headlight kit), but the roll bar and spotlights needed more thinking and tinkering. I used stainless-steel tubing for the bar and I machined aluminum blocks for the brackets. I pressed Allen-head screws into the tubing's ends, so the washers and nuts could hold the entire assembly on the truck bed. One of the screws has a hole through which the spotlight wires can exit. The spotlights are red, anodized-aluminum caps that are drilled, tapped and screwed to the light bar. Two screws come up from the bottom to hold the roll bar, brackets and light bar together. The light lenses came with the original Clod Buster parts and just happened to fit perfectly! What luck! I wanted to hide all the attaching screws as much as possible.

The taillights are Tamiya headlight bulbs that I put on the inside of the body (behind the taillight lens) in their own little plastic compartments. The light only shines through the lens and doesn't light

up under the pickup bed, so it doesn't attract low riders. The turn signals are made by RAM*, and I installed them from the inside so the lights are flush with the outside of the body.

I made the front and rear bumpers in the same way as I made the roll bar, but I added a trailer hitch to the rear bumper. The hitch can be attached to the chassis so that when I pull the dump trailer, there's no stress on the body. The gear-case bumper guards are of aluminum tubing, with machined-aluminum brackets. (I machined the brackets using a 16-speed drill press.)

Of course, no truck would be complete without good-looking custom wheels, so I drove to the hobby store and ordered a set of four TMS* one-piece aluminum

wheels. While I was there, I saw that a Clod Buster had been brought in for chassis repairs. A piece of plastic about the size of a dime (still attached to the ball end and swing arm) was torn out of the chassis' side. Needless to say, when I returned

home I made a chassis brace. It's an aluminum one-piece unit and, no, you don't have to remove the brace to reach the servo screws!

The two saddle tanks, which fit perfectly over the battery and covers, were taken from an old dump truck. My son painted the driver (which came from our Blackfoot) to resemble the "Crabbin' Clod's" creator! For better visibility from the inside out (or the outside in!), I cut out the tinted side windows and replaced them with clear plastic. To keep the dust out of the cab, I used double-sided tape to install a piece of Plexiglas (painted black) between the truck bed and the hood. To keep the pickup bed clean and free of scratches, I cut a rubber bed liner—it fits like a glove!

The wiring and the servos for the lights and turn signals are attached to the underside of the body. There are two reasons why it's set up this way: I can remove the body and keep the paint job looking



good, and I've reduced weight. You see, when the Clod and I go stomping on the track, he wears a light Lexan body and, boy, does he ever love to run over those cars!

THE PAINT JOB

The Clod's original white body had been in many battles, and the scars, scratches and paint marks from other cars looked tacky. This is an area in which I'm not very talented, so a friend of mine who's a custom painter helped me with the bodywork and painting. (After all, he had already painted the 4x4 that's parked in my driveway!) When I walked through his garage door, I was expecting a snow-white truck, but what I saw was ten times better!

He used House of Color, candy red, acrylic-lacquer paint over a dark, "charcoal pearl." The tape is a "silver mist," and he added pinstripes. To protect all that beautiful work, he applied several coats of clear polyurethane. He even covered the trailer-dump bed with the same materials and paint for a matching customized "look"!

THE DUMP TRAILER

In *Car Action* I had read about what a Clod Buster truck could pull, and my Clod was put to the test on one cold winter night. It actually pulled a large red wagon with a 50,000Btu space heater in it, up my neighbors' driveway and across the street to our house! The wagon's handle was tied to Clod's rear gear-case bumper guards with a small "bungee" cord. I knew it wouldn't be a big deal for the Clod to tow a custom-made dump trailer.

I already had the swing arms and some other Clod parts, because I had to buy an entire sheet of plastic parts when I replaced the

(Continued on page 64)

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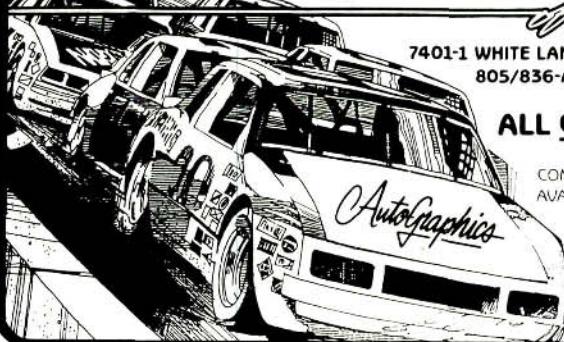
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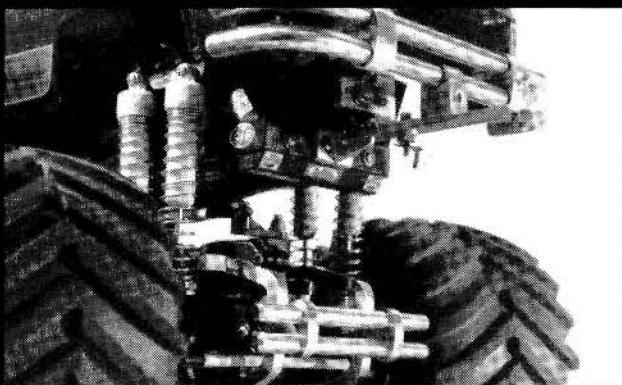
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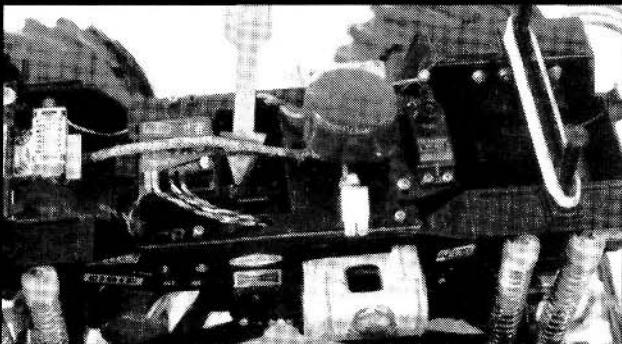
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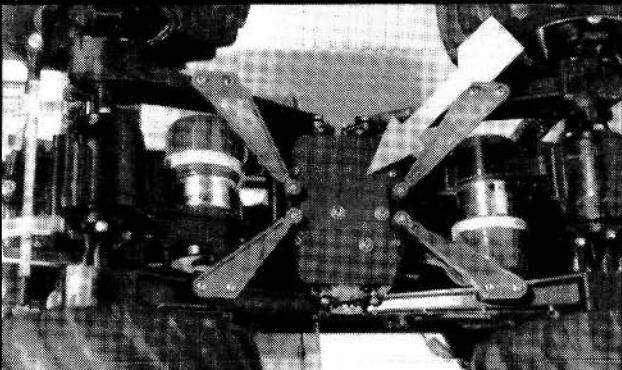




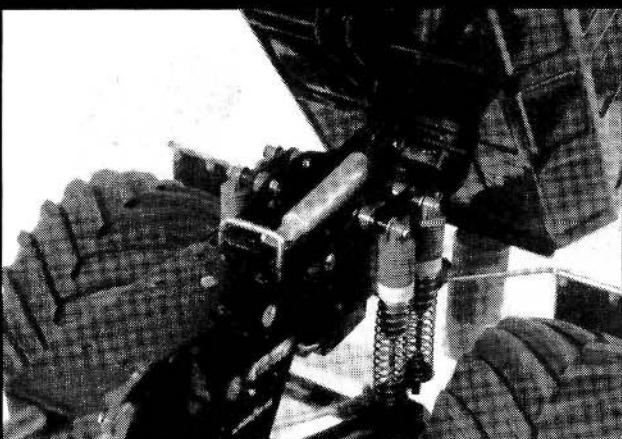
This shows Crabin' Clod's rear end. Note the ball hitch to which the trailer can be attached.



This shows the Crabin' Clod's "inner workings." To operate the Clod, the RF module of a 7-channel model-airplane radio was converted for surface frequencies.



This ground-level shot shows the custom-made chassis brace.



To raise the bed, a Futaba S148 servo releases a clip that holds it down and a hydraulic cylinder lifts it.

body mounts. The rest of the trailer came from an old, toy, dump truck that was out of commission. Its chassis became a trailer chassis and, with a little sheet-metal work riveted onto it, I duplicated the rear half a Clod chassis. Then I attached the stock Clod Buster swing arms, shocks, wheels and tires. The original dump bed was too small for 1/10 scale, so I replaced it with a dump bed from a Tonka truck. I made the trailer hitch out of a carburetor ball joint that I turned and polished on my drill press. The hitch is internally spring-loaded, and this damps the push/pull action to which the trailer subjects the hitch when it moves or stops.

I control the aluminum tubing roll bar's internal, red, flashing caution light with a micro toggle switch that's mounted on the left of the chassis and is powered by two AA batteries that are stored inside it. The mud flaps (required by law) were handmade of black rubber.

Under the pressurized hydraulic cylinder is an S148 Futaba* servo that releases the hold-down lock for the dump bed. I use the cylinder to raise the bed, and lock it back into place by pushing it all the way down. To keep it free of scratches, I added a rubber bed liner that matches the pickup-bed liner.

The taillights are red aluminum caps and red plastic lenses with Tamiya lightbulbs, and the turn signals are an extra pair of RAM amber lenses and bulbs. I connected the taillights, turn signals and dump servo to a 9-pin, male, quick-connect plug from Radio Shack, and I covered the wires with a stainless-steel braid to protect them. I attached a safety tow chain (also required by law) to the bracket that holds the telescopic, self-locking, aluminum, parking support for the trailer when it isn't in use. When "on the job," the support is stored against the trailer chassis and held up by a spring clip.

ELECTRICAL FEATURES

Originally, I operated the Clod with a 2-channel Futaba radio. I controlled the lights with two micro toggle switches mounted on the pickup bed where the plastic roll bar was attached. I just wasn't a happy four-wheeler with this setup, though. I couldn't radio control all the lights, the dump trailer and the "crab" steering. Let's face it: the ultimate in R/C modeling is controlling lots of gadgets with radio waves! I was lucky to find a Futaba FG series, digital-proportional, dual-rate, 7-channel radio for a very good price.

This radio is meant for model airplanes, but I changed the RF module for surface frequencies.

(Continued on page 178)

INSIDE THE THUNDER

WINSTON CUP STOCK-CAR racing has to be one of the most competitive forms of racing in the U.S. Drivers like Bill Elliot, Dale Earnhardt and Rusty Wallace have had their fair share of victories, but because of the nature of this type of racing, none has completely dominated.

Just about anything can happen over the course of 500 miles, and this makes



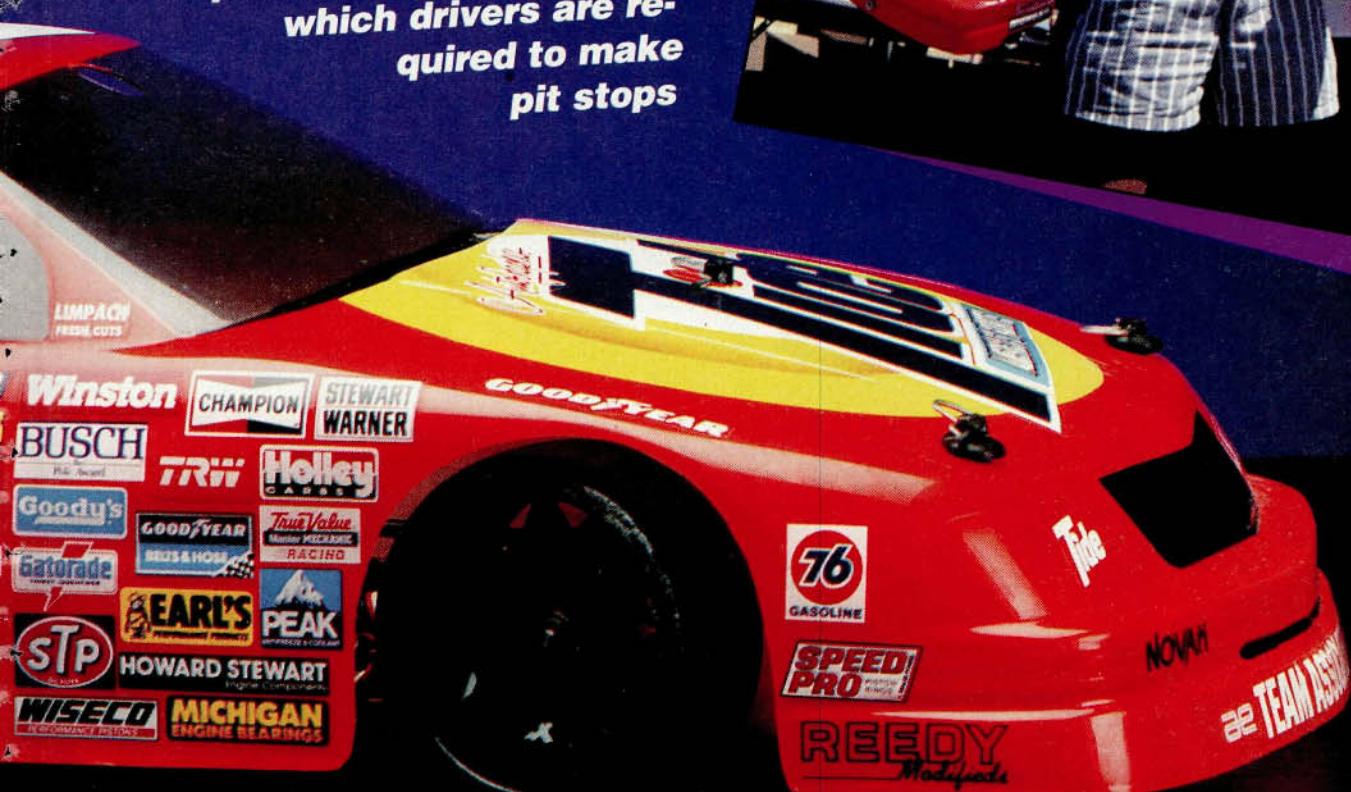
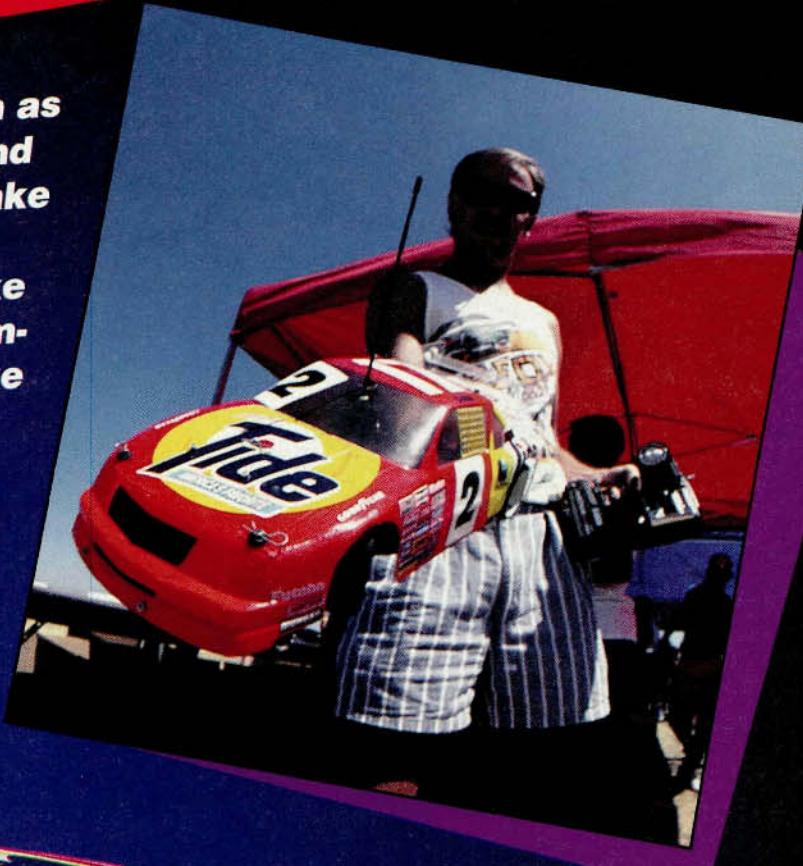
by STEVE POND

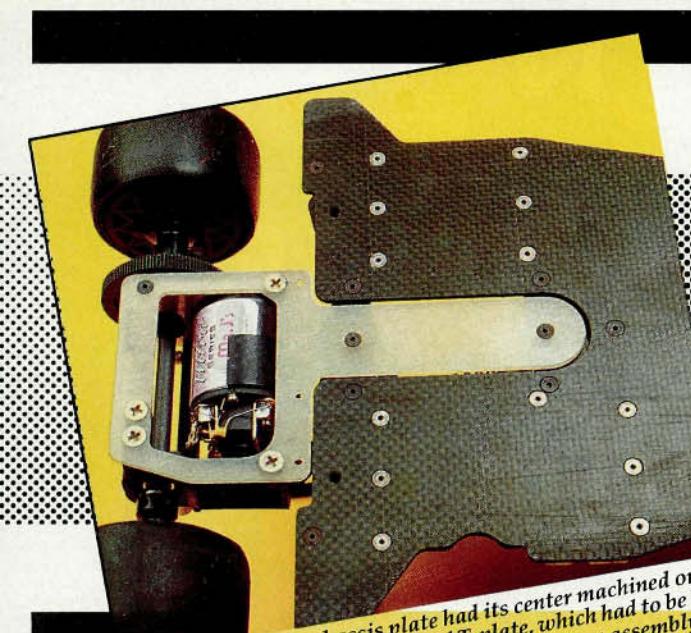
Clausen's quick-change cleans up

WINNING FROM THE CAR

stock-car racing a war of attrition as well as a driving contest. Tires and engines can blow, crashes can take them out, or it could be that the suspension just isn't right. To take the checkered flag, all of the components have to combine to make one car faster than the rest of the field.

The same can be said for R/C superspeedway racing, in which drivers are required to make pit stops

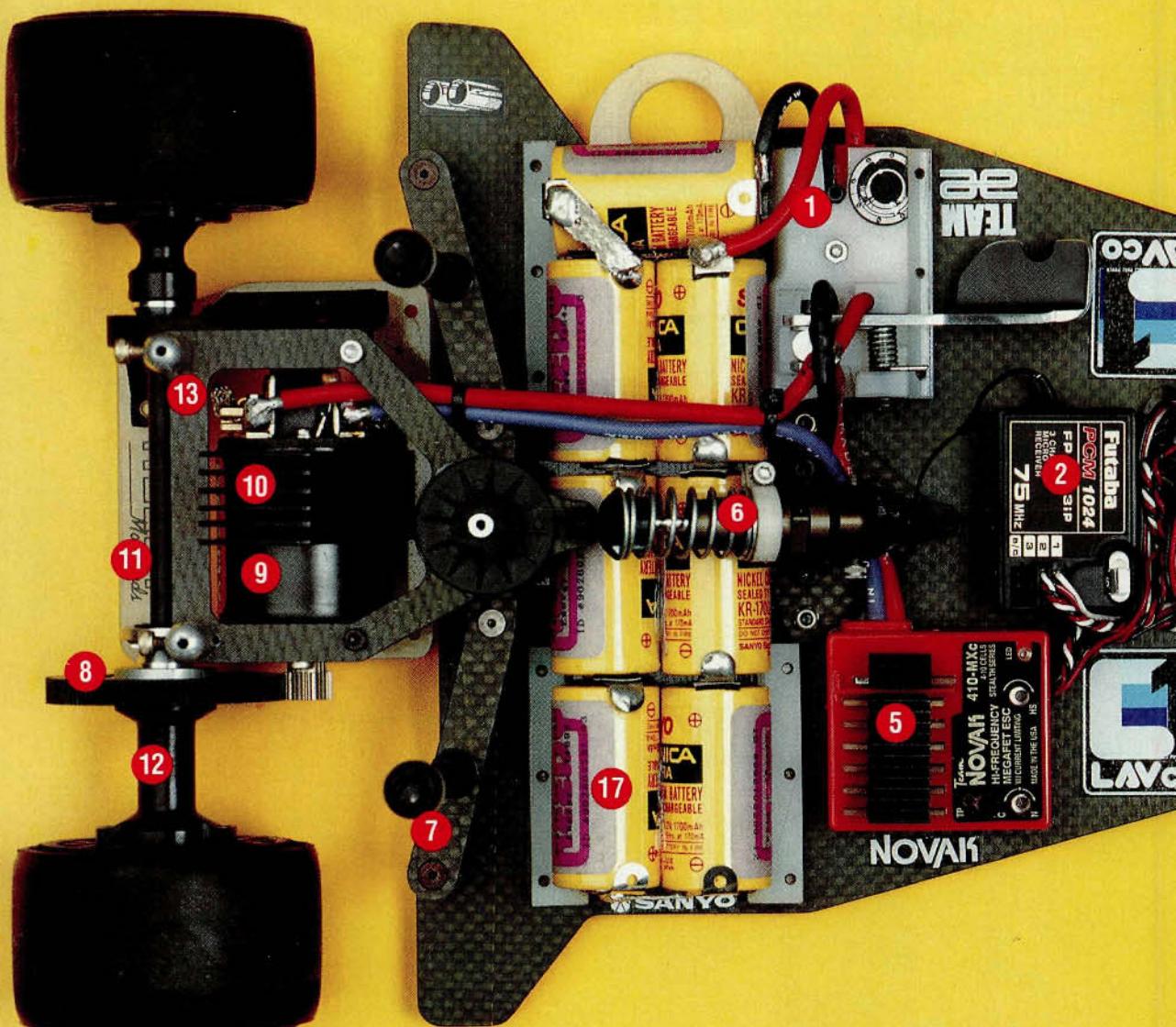




The custom-made chassis plate had its center machined out to accommodate the flush-mounted T-plate, which had to be lowered to make room for the quick-change battery assembly.



The steering assembly is anchored with a Futaba S9101 servo, and it features RCPS Titanium steering rods.



for fresh batteries to cover the distance to the checkered flag.

All of the problems that haunt the Winston Cup drivers can work against R/C racers in a superspeedway contest. You can make any car go fast, but to tune and drive a car to go faster than any other and complete the race requires a special talent.

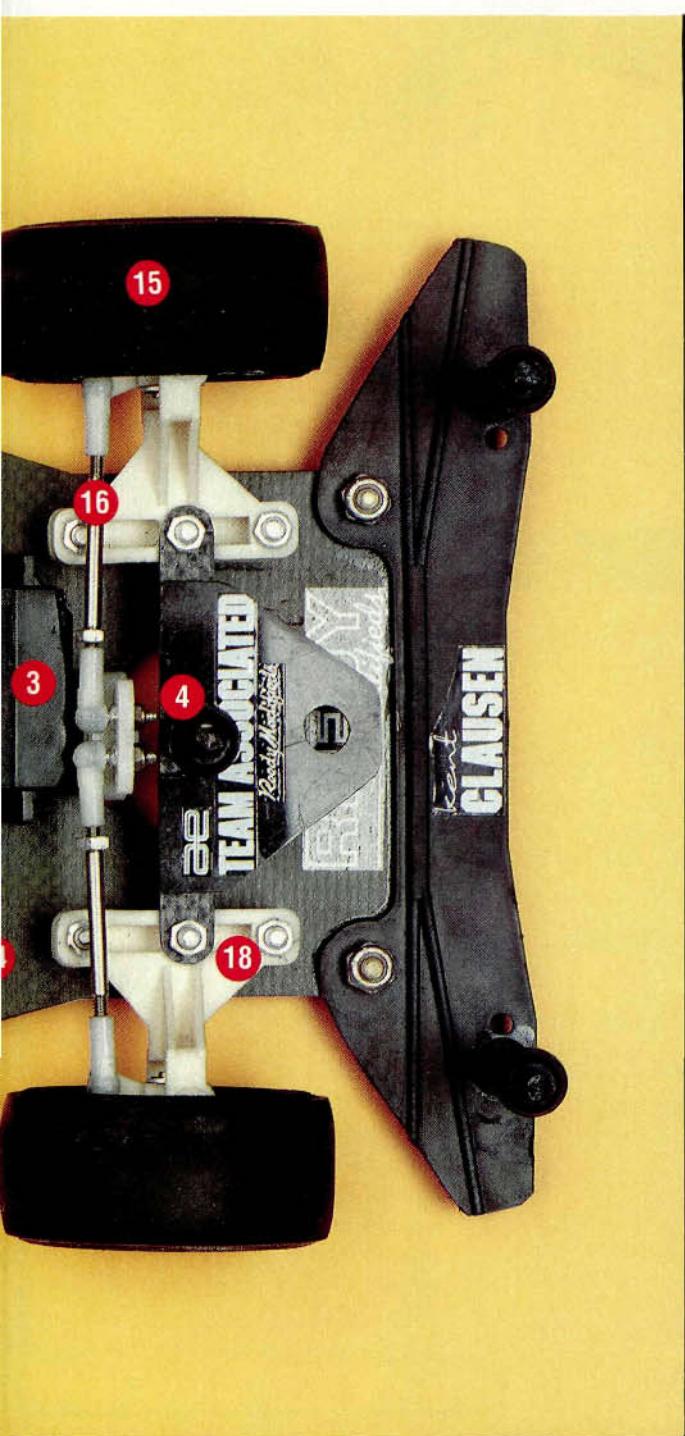
During this year's R/C Thunderdrome, Kent Clausen of Team Associated* once again demonstrated his driving prowess on the monster high-banked oval in Encino, CA. This is his third consecutive win in one category or another over the three years the race has been run!

In the first running of the Thunderdrome, Clausen took top honors during the Superspeedway racing, and although

he lost the Insane Speed Run to teammate Mike Lavacot, he turned the fastest single lap at 56.1mph before a spectacular blow-over on the back straightaway, which cost him the overall win.

During the second race, Clausen set the track on fire during the speed run for the overall win, but this time, his fastest single was clocked at 70.1mph! This year's contest was no exception: Clausen set TQ with the only 71-lap run during qualifying, and then he blazed to victory in the Superspeedway Class.

As always, winning a race like the Thunderdrome requires the ultimate combination of driver and machine, especially when you're up against such talented company. There's no



1. Custom-made quick-change battery system
2. Futaba PCM radio
3. Futaba S9101 servo
4. Suspension brace/transponder mount
5. Novak 410-MXc
6. Hard-anodized shock with silver spring & 40WT oil
7. Damper & body-post stand-off
8. Du-Mor R/C 120-tooth spur with 23-tooth pinion gear & Associated carbide diff balls
9. Reedy Ultra Series 12-turn motor
10. Holeshot Racing "Super Cooler" heat sink
11. One-piece T-plate and lower motor plate
12. Lightened, balanced, black-anodized hubs
13. Narrow rear pod
14. Custom, narrow, graphite chassis
15. TRC gold-compound BBS T/M Radials
16. RCPS Titanium steering linkage & aluminum ball links
17. Reedy Matched "World Packs"
18. Suspension block custom-machined for 2 degrees camber

question about Kent Clausen's driving skills. He's considered one of the world's top on-road drivers, and he's quickly becoming a dominant force in oval racing. What machine did Clausen team up with for victory at the Thunderdrome?—as you'd expect, a hybrid version of the popular Team Associated 10L Superspeedway car that's scheduled to be released soon.

ONE MEAN MACHINE!

The chassis on Clausen's car is a custom-made, one-piece plate that's similar in configuration to the standard Superspeedway version, only it's designed to accept a quick-change battery system. A slot was machined on the rear of the chassis plate to accommodate the 5/64-inch (.078) fiberglass T-plate that's mounted flush with the chassis' bottom. (The standard 10L T-plate is mounted on top of the chassis.)

There are two pivot balls on the tongue of the T-plate to hold it onto the chassis, but instead of sitting directly on the T-plate, they're mounted in stand-offs that span the relief in the chassis. Likewise, the tweak-adjusting screws are mounted in the front stand-off, and they apply pressure directly to the T-plate (instead of being mounted in the T-plate and applying pressure on the chassis for adjustment).

Mounted to the rear of the narrow T-plate is a pair of 12L

pod sides, topped with a narrowed version of the 10L upper plate. Damping is accomplished with a traditional 10L shock and mount, only this shock is spaced an additional 1/2 inch off the chassis to allow the 7-cell stick packs to slide underneath. With the exception of a hard-anodized coat



The custom-made, quick-change battery system in Clausen's car was one of the most reliable on the track as far as holding its batteries in, and it uses Sermos connectors, which are the most efficient in the business.

on the aluminum, the shock is standard issue in the 10L kit. Using the standard piston, Clausen filled the shock with Team Associated 40WT silicone oil, and he used a silver spring spaced approximately 3/32 inch from the fully extended position.

To slow the car's side-to-side movement, a standard Associated damper assembly is mounted just behind the shock on the pod. The damper post is mounted in a stand-off roughly 3/4 inch off the chassis plate, just over the rear pivot ball for the T-plate. This is essential to allow the new T-plate design to pivot properly, but the shorter damper post is also more rigid for more precise damping. The damper-post stand-off, which spans the width of the chassis, also serves as a mount for the body posts. The body posts are substantially shorter and stronger, and this can reduce buffeting of the body at high speeds, resulting in more stable handling.

Passing through the 12L pod sides is a standard 10L rear axle and diff assembly with the ride-height adjuster set for minimum ground clearance. Instead of using stock thrust bearings on both sides of the axle, Clausen installed custom-made thrust cones. The risk of damaging the bearing is increased

ASSOCIATED ELECTRICS 10L SUPERSPEEDWAY CAR

Type Quick-change Superspeedway
Scale 1/10

DIMENSIONS:

Overall Length 18.25 inches
Width 8.18 inches
Wheelbase 10.3 inches
Front Track 6.34 inches
Rear Track 6.54 inches

WEIGHT:
Gross (w/battery) 3.1 pounds

BODY:
Type Associated Superspeedway Lumina
Material Polycarbonate

CHASSIS:
Type Plate
Material Graphite

DRIVE TRAIN:
Primary Pinion/spur
Differential Ball type
Bearings Ball bearings

SUSPENSION:
Front: Type Modified kingpin

Damping Silicone lube
Rear: Type T-plate
Damping Oil (40WT)

WHEELS:
Front: Type TRC BBS
Dimensions (DxW) 2x1.125 inches
Rear: Type TRC BBS
Dimensions (DxW) 2x1.5 inches

TIRES:
Front/Rear T/M Radials (gold dot)

ELECTRICS:
Radio Futaba PCM
Servo Futaba S9101
Motor Reedy Ultra Series 12-turn
Battery Reedy Matched "World Packs"
Speed Controller Novak 410-MXc

OTHER ACCESSORIES:
Du-Mor R/C gears; Associated carbide diff balls and silicone shock oil; Bud's Racing wing, wing mounts and roll-over antenna; Holeshot Super Cooler motor heat sink; Kimbrough large servo-saver; RCPS titanium linkage and aluminum ball links; Autographics decals.

Clausen is considered one of the world's top on-road drivers, and he's quickly becoming a dominant force in oval racing.

with such a setup, but the drag and weight of the thrust bearings are eliminated. Both aluminum hubs were machined for lightness, balanced and given a black-anodized coating, which is more for appearance than function.

The differential assembly consists of a Du-Mor* R/C 120-tooth 64-pitch spur gear with Associated carbide diff balls, standard diff rings (that were scuffed on the back side to prevent slipping) and a Bud's Racing* thrust-cone assembly behind the diff adjuster nut.

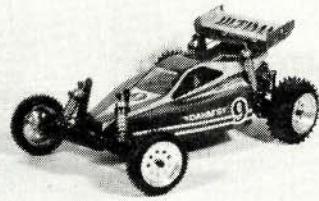
The front end of Clausen's 10L uses the stock suspension components that were slightly modified for running on the high bank of the Thunderdrome. To reduce tire wear and improve steering, the right-side suspension was machined for 2 degrees of camber, while the left side was machined shorter to compensate for the change in ride height. The sides are connected by a graphite brace, which also serves as a mount for a third body post in the hood area and the transponder mount. The right-side suspension uses a no. 22 spring, while the left uses a no. 20 spring. Heavy silicone lube provides additional damping, and there's a 2-degree-caster wedge under the arms on both sides of the front suspension.

The electronics package is anchored by a Futaba* PCM 1024 radio system that's connected to a Novak* 410-MXc electronic speed controller for the throttle and a Futaba S9101 ball-bearing, coreless motor servo for steering. At the receiving end of the speed controller is a Reedy* Ultra Series 12 modified motor with a 23-tooth Du-Mor R/C pinion and a Holeshot Racing* Super Cooler heat sink. Powering Clausen's car is a slew of Reedy matched "World Packs," which are mounted on a custom-made quick-change system using efficient Sermos* Power Pole connectors.

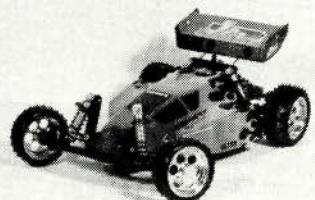
Completing the winning package are a set of TRC* BBS T/M radial tires, a Bud's Bi-Level wing and an Associated Chevy Lumina Super-speedway body, which Kent himself finished using Autographics* and other assorted decals.

Congratulations to Team Associated, Lavco, Kent and his pit crew (Akira Kogawa, Gary Sellers and Dominic Sellers) for this fantastic Thunderdrome victory!

*Here are the addresses of the companies mentioned in this article:
Team Associated, 3585 Cadillac Ave., Costa Mesa, CA 92626.
Du-Mor R/C, Inc., 1002 Union Landing Rd., Cinnaminson, NJ 08077.
Bud's Racing Products, 52435 Route 113, Wakeman, OH 44889.
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.
Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.
Reedy Co., distributed by Associated Electrics.
Holeshot Racing Products, P.O. Box 630, Canton, MA 02021.
Sermos R/C Snap Connectors, Cedar Corners Station, P.O. Box 16787, Stamford, CT 06905.
TRC, P.O. 1058, 2211 Charter St., Albemarle, NC 28002
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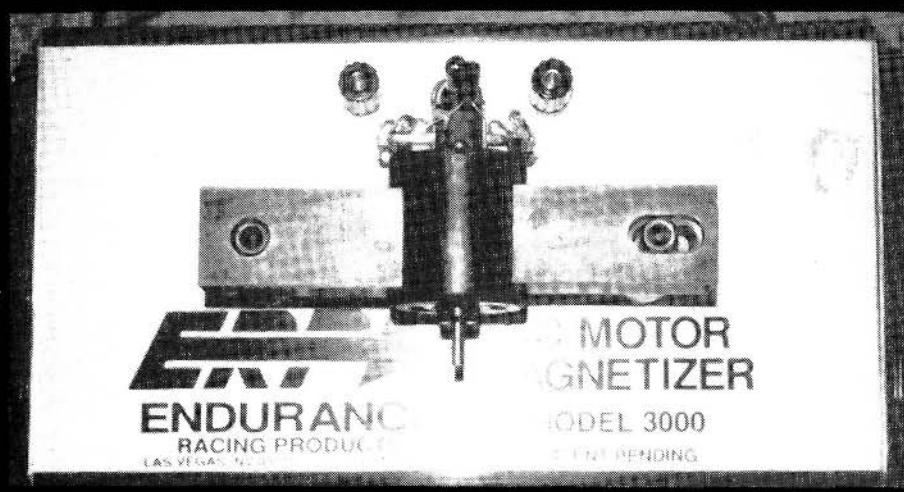
magNet

ERP

by
JIM SHEPKA



Heat-weakened magnets in stock motors can be "zapped" back into condition without removing their endbells.



ZAPPER

Animal magnetism

ENDURANCE RACING Products* (ERP) has introduced the first DC-powered motor magnetizer. Magnetizers have been around for ages, but this is the first really portable DC-powered unit that average racers can use at the track.

What does it do, you ask? I wondered, too, until I spoke with ERP's owner, Dave "The Zapper" Cleveland. Have you ever wondered why your motors lose their "punch" after a few runs? He gave me one

reason: to get the most out of them, you have to use very aggressive gearing, which creates a tremendous amount of heat.

What effect does this heat have? As well as the obvious fact that it can burn your fingerprints off (I know we can all relate to that!), your motor brushes turn blue, the commutator expands and contracts, and the magnets are on the verge of melting. Because I'm talking about stock motors here, you can do little to the commutator (legally, anyway!) except clean it with a commutator stick. You can also replace and realign the

brushes, and then you can revive the magnets in as little as 20 minutes.

A QUESTION OF POWER

A good way to test your motor's magnet power is to put a pinion on the motor shaft, release the spring tension on the brushes, and spin the commutator. If you've oiled the bushings and there isn't excessive end play, etc., you should notice that it spins with some resistance. Run the motor a few times, and repeat the process. You'll probably notice that there isn't as much resistance as there was when it was new. It's a safe bet that the magnets have lost some of their effectiveness. If putting in new brushes, realigning the hoods and cleaning the commutator have little effect on a motor's performance, it's time for a "zap"!

As I understand it, when a magnet is subjected to a specific amount of heat, its power is reduced accordingly. (This might explain why scientists spend zillions of dollars super-cooling the magnets of an Atom Smasher.) Because you can't realistically keep a motor's magnets at absolute zero (although I did see someone try to encase a motor in dry ice while it was in the car—really!), rejuvenating them is the most practical and effective way to make your motor run like new.

(Continued on page 78)

A 20-minute stint on the ERP Magnetizer is a legal way to revitalize your stock or modified motor.

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LETTERS

(Continued from page 20)

this, you can add a separate battery pack for the radio, or try using an electronic speed controller. You must make sure,

however, that the receiver pack is fully charged. If it dies when the motor battery is fully charged, you could have a very fast runaway!

JH

MORE CONTROL FOR THE PHYSICALLY CHALLENGED

I read your mag every month, cover to cover, at least twice—it's the best! I'm writing in response to Gary Brunazzi's letter in the September '90 issue.

(Continued on page 86)

TRAXXAS HAWK: THE VALUE LEADER IN KITS AND READY-TO-RUNS.

When you're looking to purchase a new truck, you want to get the most for your money. In order to find the best value, there are many different points to consider. Is the transmission strong enough to hold up without the addition of expensive aftermarket components? Do the shocks provide any real dampening power, or are they just for show? Is the suspension designed properly, and does it operate smoothly while resisting breakage? Is it easy to adjust? Are there aftermarket performance accessories available to customize your truck? Obviously, there is much to think about.

As you carefully consider your choices, think about Hawk, TRAXXAS' newest truck. Hawk's planetary gear transmission uses 48-pitch, metal internal gears, which make it the toughest gear differential in the industry. The telescoping U-joint drive shafts are the same ones used on the National Championship-winning Eagle.

Hawk's high-volume, oil-filled shocks are not toys. They are fully rebuildable to maintain peak performance, and they can be finely tuned with different piston head selections



and adjustable spring height.

Hawk's virgin nylon suspension arms simply won't break and are designed to provide a large amount of usable suspension travel and high ground clearance. Turnbuckles are standard for easy adjustment of the caster and camber angles. The tub-style chassis is neat and compact, and the battery mounts longitudinally for superior weight distribution.

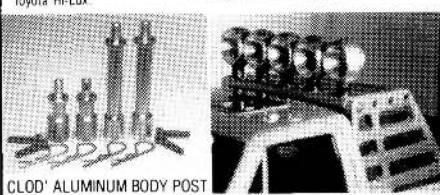
It is easy for anyone to make Hawk beautiful with the Lexan body and complete chrome and neon decals. For even more versatility, Hawk can be customized with all the same TRX performance accessories (i.e. ball differential) that propelled the TRX-T Eagle to

TRAXXAS' first National Championship.

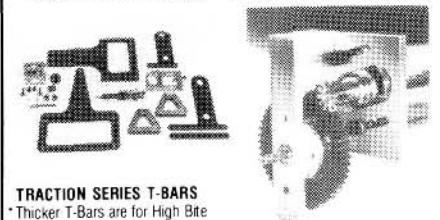
When you compare, you'll find that Hawk kit offers many more features and superior durability, for less money than a Blackfoot. For a small amount more, Hawk can be purchased fully-assembled with a high powered pistol radio, something the other trucks don't even offer.

You won't find Hawk in a toy store. It is available only through your local hobby dealer. Call or go by today and see for yourself why Hawk's got the others beat.

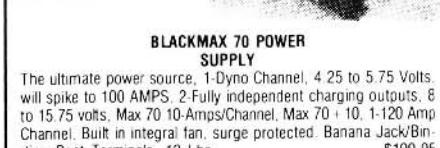
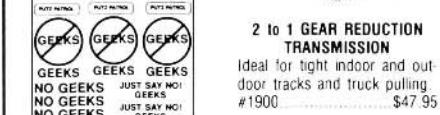
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MAGNET ZAPPER

(Continued from page 74)

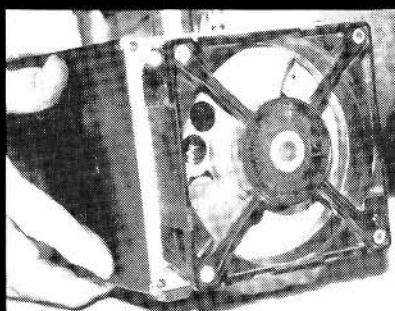
A TRUE TEST OF POWER

I asked the members of my club to donate their "tired" motors for a test. Because I wanted to base this experiment solely on the motor magnetizer's effectiveness, I performed no maintenance on the motors before I "zapped" them. I tested them on a motor checker and took amp load and rpm readings. I zapped each motor for 20 minutes and allowed it to cool before re-evaluation. In eight out of 10 cases, rpm had increased an average of 1,500! In all cases, the armature was more difficult to turn.

The *true* test was at Mike's Speedway in Hadley, MA. With my usual motor, battery and car setup, I ran for 4 minutes and turned in a 53-lap effort (4:07.5). I performed routine maintenance, and I zapped the motor for 20 minutes. When it had cooled (this magnetizer creates an incredible amount of heat), I went back out with a pack that had the same discharge rate as the one I had used on the first run. When the smoke had cleared, my time was nearly 1½ laps faster: 54, 4:02.2—an unofficial track record! The car came off the turns with a little more "pop," and the motor wasn't nearly as hot as usual. As far as I'm concerned, it passed my test!

POINTS TO PONDER

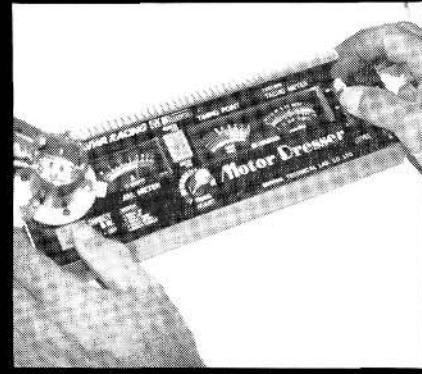
The magnetizer's instructions suggest that you "zap" for only 20 minutes at a time using a 12V (10A) power source. Because some motors might need it, you can zap them



An exhaust fan (bought at a local surplus supply house) kept the Magnetizer unit cool.

longer. The instructions also suggest that you add exhaust fans, and ERP includes a wiring diagram to show you how. During a visit to a local surplus store, I found a couple of fans that fit the bill (\$2 each!) and, once mounted, they really helped to keep the unit cool.

The results I describe are averages: some motors (both new and used; stock and modified) showed considerable increases in rpm and torque, and very few showed little or no change. (There's always that 10



A Shinwa Racing Motor Dresser was used to measure the motors' amp loads and rpm before and after they were "zapped." There was an average increase of 1,500 rpm!

to 15 percent that can't be helped.)

The long-run effect of this device on your motors is unclear. If a motor goes "soft," however, and you're just going to throw it into the bottom of your sock drawer, why not "zap" it?

I'm concerned about the unit's cost (\$249.95). It might be too expensive for you to buy yourself, but club members or a hobby shop could pitch in and make it available for general use. Serious stock racers should definitely look into it.

Chemicals and batteries can only take you so far, and no matter what you do to a motor, heat adversely affects rpm, amp draw and torque. If you can justify the expense, this motor magnetizer might be your ticket to the A-Main!

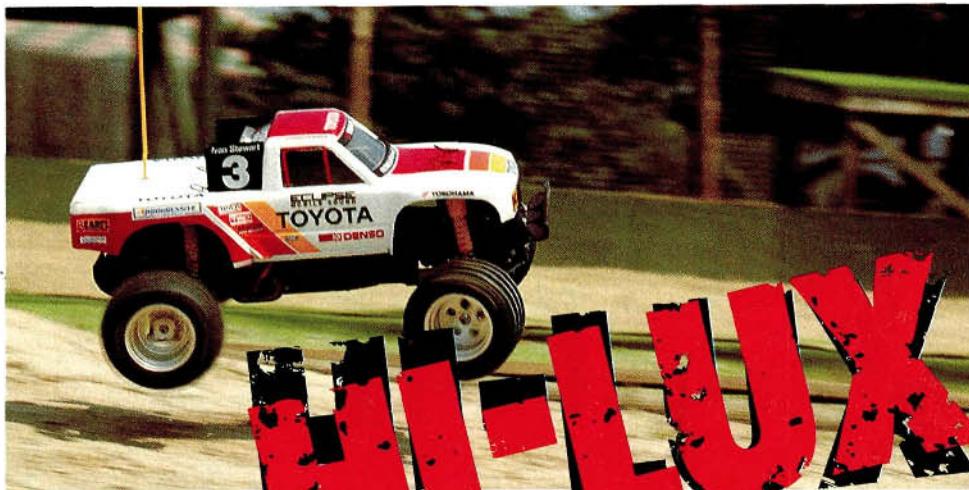
*Here's the address of the company mentioned in this article:
Endurance Racing Products, 826 N. Lamb, Las Vegas, NV



ART FLUX



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STOMPER

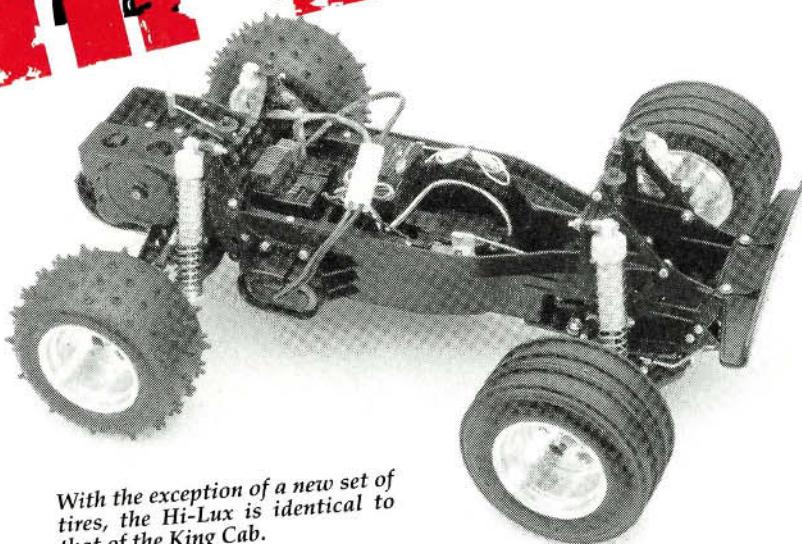


by STEVE POND

TAI MIYA* HAS always offered kits for beginners—cars and trucks that are durable, inexpensive and easy to build. To accommodate the growing number of racing enthusiasts, the company has now added several high-performance kits to its line.

Monster trucks are one of Tamiya's biggest lines. It put the "monster" into monster truck with classics like the Blackfoot and more contemporary trucks like the Clod Buster. It didn't capitalize on the latest boom in specialized racing trucks until late 1989, however, and this was well after the competition had made its move. The King Cab was Tamiya's first racing truck, and it had several new features: 4-wheel independent suspension damped by oil-filled, coil-over shocks; adjustable upper linkage; a rack-type steering assembly; light, one-piece plastic wheels and an adjustable ball differential.

The Hi-Lux—Tamiya's latest racing truck—uses the same chassis as the King Cab. In fact, except for a new body (which is based on Ivan Stewart's Toyota stadium truck) and better tires, the Hi-Lux is essentially the same as the King Cab.



With the exception of a new set of tires, the Hi-Lux is identical to that of the King Cab.

ASSEMBLY

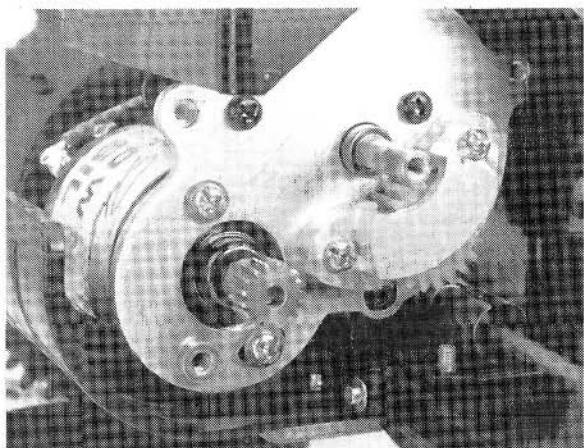
Of all the racing trucks, the Hi-Lux is the easiest to assemble. No, it's not because there are fewer parts—there are plenty; it's because the instructions are excellent, and all the components fit perfectly.

Assembly begins with the steering, the front suspension and a part of the rear suspension. (The rest of the rear suspension is assembled after the transmission has been installed). Assembling the transmission is easy because it includes a ball differential, but there's a catch: the differential is adjusted with internal shims instead of with the traditional Allen screw. The unique design of the Tamiya diff includes the standard differential gear, which

houses the diff balls. The diff rings (similar to those by Team Losi*) have a hex-shaped center hole to key them to the diff and prevent slippage. Thrust bearings on either side of the diff rings are backed up by thrust washers and disc springs. The adjusting shims are sandwiched between the disc springs and the differential housings. The more shims you use, the tighter the diff.

I've found that it's better to start with no shims in the differential. Once it's assembled, check its adjustment





To greatly reduce the chances of stripping the counter gear when using a modified motor, Stormer Racing's aluminum counter-gear brace is highly recommended.

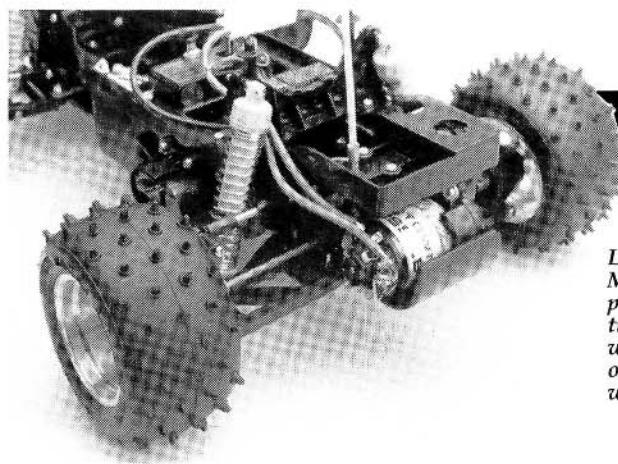
by putting two flat-head screwdrivers into the slots in the gearbox joints, and then attempt to rotate the diff gear to simulate diff slippage. It should be difficult to spin the gear while you're holding the drive joints in place. If the gear rotates easily (you shouldn't be able to rotate it with two fingers), then add a shim to both sides of the diff. If the diff is still too loose, continue to add shims until the tension is correct.

Then the diff can be installed with the other components in the transmission housing. Attach the transmission to the chassis; then attach the rear suspension. Assemble the Tamiya yellow, oil-filled shocks, and attach them to the four corners of the chassis. Most of the assembly is now complete on the chassis, and the installation of the radio gear is next.

Unique features of the Hi-Lux are the motor and the mechanical speed controller. Although these components aren't worthy of competition, they're good enough for someone who wants a nimble truck, but not the extra expense of an electronic SC and a high-performance motor. I took a few liberties with the electronic gear. We try to test our vehicles in box-stock condition; however, I've had plenty of experience with the stock hardware in the King Cab, and I wanted to add some racing gear to see how the Hi-Lux would perform. I dusted off my old Futaba* Magnum Sr. with its 4-channel receiver (although the transmitter has only three channels) and an FP-S132H servo. I replaced the mechanical speed controller with a Tekin* 411P, and I left the stock Mabuchi 540 motor in the box and opted for a Team Losi Motown Missile.

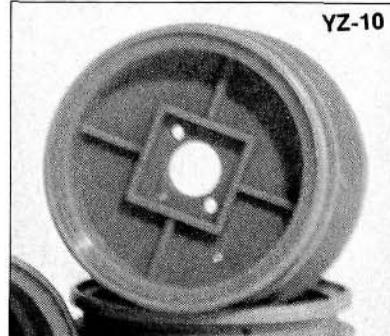
The Tekin 411P is the latest in high-frequency speed controllers, and its features make it desirable for racing: for maximum efficiency, its resistance is very low; its high-frequency pulsing is much easier on the motor and on the batteries; and it has a regeneration feature. Ac-

(Continued on
page 84)



Powering the Hi-Lux is a Team Losi Motown Missile—a powerful 12-turn single wind capable of producing warp speeds.

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TAMIYA HI-LUX

Type Racing monster truck
 Scale 1/10
 Sugg. Retail Price \$230

DIMENSIONS:

Overall Length 17.5 inches
 Width 11.75 inches
 Wheelbase 10.63 inches
 Front Track 10 inches
 Rear Track 9.88 inches

WEIGHT:

Gross (w/bat.) 4 pounds, 5.7 ounces

BODY:

Type Toyota Hi-Lux
 Material Polycarbonate

CHASSIS:

Type Tub
 Material Plastic

DRIVE TRAIN:

Primary Pinion/spur
 Transmission Gear drive
 Differential Ball differential
 Bearings/Bushings Ball bearings
 for trans; bronze bushings for wheels

SUSPENSION:

Type (f/r) A-arm, upper control link
 Damping (f/r) Oil-filled,
 coil-over shocks

WHEELS:

Type (f/r) One-piece plastic
 Dimensions (DxW) (f/r) 2.5x2 inches

TIRES:

Front/Rear Ribbed/spiked

ELECTRICS:

Motor RS-540
 Battery 6-cell stick*
 Speed Controller 3-step forward
 w/reverse

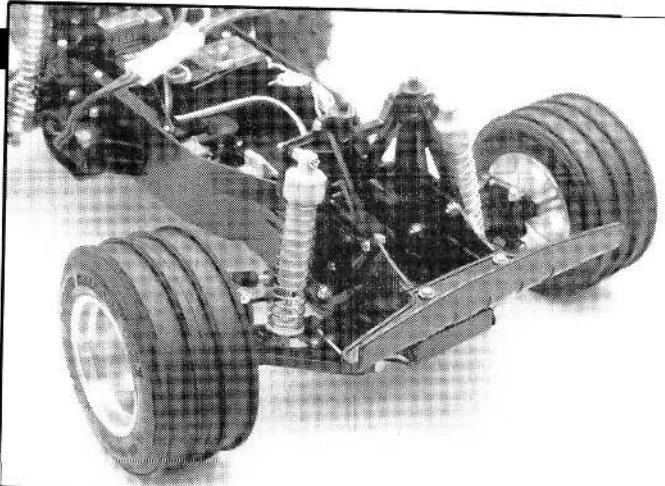
OPTIONS AS TESTED:

Team Losi Motown Missile motor; Tekin 411P ESC; Futaba Magnum radio with S132 steering servo; Trinity assembled SCR pack.

COMMENTS:

Essentially a new version of the King Cab, the Hi-Lux has a racing body and a new set of tires. In its stock configuration, the Hi-Lux is versatile and user-friendly. If you add a high-performance motor, you'll have to make additional modifications to handle the increase in horsepower. When you're familiar with it, you might be able to run the Hi-Lux competitively, but it does have some shortfalls in "adjustability." Overall, this is a good kit for novices and experienced drivers.

* not included



The front end of the Hi-Lux features independent suspension with an anti-roll bar for increased stability. Yellow damper units are oil-filled and adjustable to different track conditions.

According to Tekin, regenerating occurs at any throttle position (except at full throttle) and while braking (except with full braking). Simply put, it sends a nominal charge back into the battery, and this can extend the run time by 30 to 40 seconds (depending on the track). (For more information, see "Scoping Out" in *Car Action's* December '90 issue.) The Motown Missile, a 12-turn single-wind motor, may seem excessive for a monster truck, but I wanted to see how the transmission would hold up with it. The last steps of the assembly—bolting on the tires and the wheels and detailing the body—may seem easy, but they're not. The tires are made of a very hard compound, and you'll have to wrestle them onto the rims. Of course, the upshot of this is that once the tires are on, they won't come off easily.

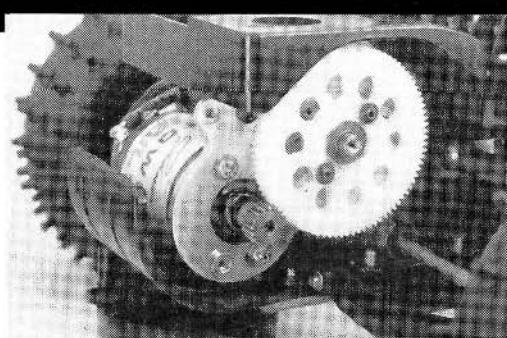
The Toyota body is very well detailed as far as Lexan bodies go, but to detail the body with the decals included is a pain in the neck. Some painting and masking is required; the dark colors should be painted on first so they won't bleed through to the lighter colors, and this is very difficult to do. I took some shortcuts, and the result was some sharp-looking paint with a little

less detail.

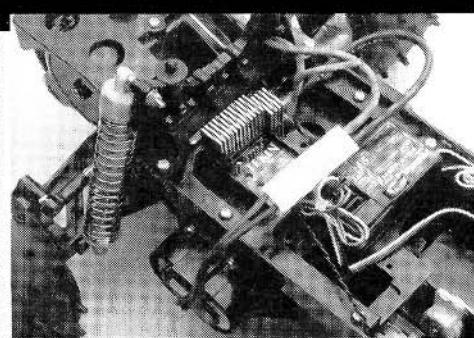
The decals are designed to work with the paint to complete the Ivan Stewart look, but the car's compound curves make them tough to lay down without creating wrinkles and air bubbles. I made small cuts where creases appeared and pressed the decals down again to improve their appearance. When the last decal was in place, I headed for the track.

THE TEST

One of the limitations of the Hi-Lux was immediately apparent when it came to choosing the batteries. The chassis was designed for a 6-cell stick pack. It's not that I wanted to run a 7-cell pack—I don't believe in them—but I did want to use some of the matched batteries that I had assembled in a side-by-side configuration. The only way to use matched cells is to assemble them in a stick configuration, and this requires tabs on the cells. Most racers are aware that only some matched cells come with tabs. The positive side of this is that off-road racing doesn't often require the use of matched batteries, and I wanted to confirm the run-time advantage that the Tekin speed controller is



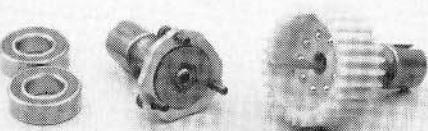
The Hi-Lux has a Robinson cluster gear that's much stronger than the standard gear and uses machined 48-pitch spurs. This allows the use of standard 48-pitch pinions instead of the scarce metric pinion gears used in the kit.



The new Tekin 411P regenerative speed controller is the only explanation for the Hi-Lux's 4-minute times with a 12-turn motor and unmatched 6-cell batteries with inefficient Tamiya-style connectors.

supposed to provide. Armed with a few Trinity* unmatched SCR packs with small wire and inefficient Tamiya-type connectors, I was determined to put the Hi-Lux and the Tekin 411 to the test.

The test track in Fairfield, CT, is reasonably fast, and the tires included in the kit turned out to be all wrong for the hard-packed surface, which resulted in very sensitive handling. I put the Sees* aluminum wheels and the stock tires back into the box, and I opted for lighter stock wheels combined with a set of Team Losi tires. I used a pair of Losi's new X-pattern tires for the rear and its standard ribbed tires for the front. The softer rubber compound proved to be the right choice for the hard-packed track.



To prevent slipping under heavy acceleration, the ball diff features special rings that key into a hex-shaped hub.

As you may have guessed, its speed with a 12-turn motor was outstanding. There was a noticeable amount of push through the sweeping turns, where I held a steady throttle, but this was easily cured with some spring and shock-oil adjustments. A little rear toe-in (about 3 or 4 degrees) managed to keep the rear end stuck to the ground, but there's no anti-squat or rear caster, which affects the steering during heavy acceleration or braking on a slick track. This isn't necessarily a design flaw; it just requires some slight driving and suspension adjustments to compete with a truck that has anti-squat built-in.

Amazingly, the Hi-Lux managed to finish a strong run in 4 minutes, with a 12-turn motor and a 1200 SCR battery. This combination of equipment shows tremendous promise for milder motors that have more efficient battery wiring. It's also a tribute to the efficiency of the transmis-

(Continued on page 190)

COMING SOON...

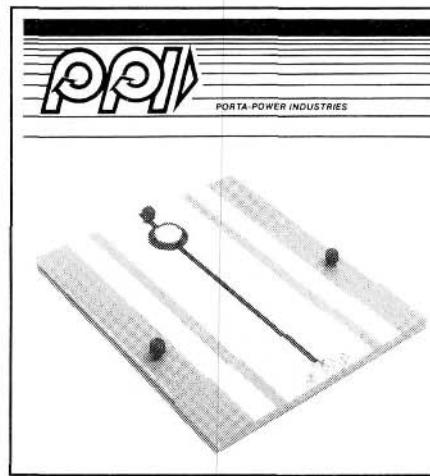
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FOR
RC-10
JRX-2
KYOSHO

LETTERS

(Continued from page 76)

Cox has recently come out with a new line of 2- and 3-channel radios called the Cobra 2 and 3. They both have a single stick that controls two functions, and the Cobra 3 has an extra thumb control. I just thought I might be of some help.

DUANE BAILEY
San Diego, Ca

Duane, thank you for your idea. I'm sure that anyone with a handicap like Gary's can use this information.

JH

CRAB CLOD

How can I change the steering on my Clod Buster so that it can "crab walk" like the real thing. My guess is that this modification would need a 3-channel system to operate. Would the Futaba 3PB radio fit the bill? Also, this servo definition has me yanking the hair out of my head! What's the difference between a S9301, S9601 and 132SH servo? HELP ME PLEASE!

ROGER BADERSHALL
Augusta, ME

(Continued on page 98)

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"GOLD BARS" #10027

FIRST LOOK:

TEAM LOSI JRX-PRO

by STEVE POND



PHOTOS BY YANNIS SUED

The kit includes long shocks and a long shock tower, a front bumper and new steering blocks that use a setscrew to lock in the kingpin.

IT'S AN understatement to say that, since its introduction in late '86, the JRX-2 rocked the R/C racing world. It was the first car in the history of off-road competition that basically included all of the necessary "trick" components for all-out racing at any level, less the electronics.

The design of the JRX-Pro is based on the original X2. Many of the parts are from the Performance upgrade kit for the X2, and there are a few new—exclusive—parts that, according to Team Losi, should make this one of the most formidable 2WD off-road cars in the world.

The features of the JRX-Pro include the thicker, longer wheelbase chassis. On the front of the chassis

are the standard suspension components of the Performance Kit with new steering blocks that lock in the kingpin with a setscrew. A new bumper is included; it was modified from the bumper included in the Performance Kit and requires no spacer under the bulkhead.

The steering linkage has also been slightly modified with rigid steering bellcranks, a shorter steering rack and longer linkages for less angle of deflection at full suspension travel. Suspension travel is increased by the longer front shock and Pro shock tower.

Moving toward the rear of the car, there's a new battery box that has been redesigned for using packs assembled in a saddle

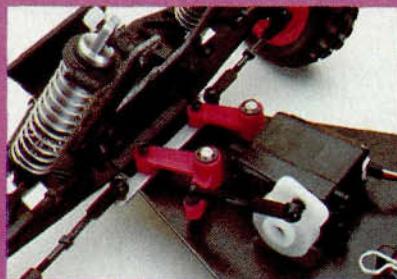
configuration.

The rear is where the changes on the Pro are most evident. For starters, the shocks are .3 inch longer for more suspension travel, and they're attached to a Pro shock tower. The shock tower is spaced forward from the bulkhead, and the shocks are attached to the rear of the shock tower instead of to the front. This keeps the shocks lined up with the direction of suspension travel when using the H-arms.

A new rear bulkhead has additional inboard holes that are required for use with the H-arms. The H-arms themselves are made of a stronger material, and



To prevent pinching wires when using saddle packs, a new battery box was designed.



The steering linkage on the Pro no longer combines the servo-saver and the bellcranks. The bellcranks are solid, and the servo-saver (a large Kimbrough is required) is attached to the servo. The hole in the chassis accommodates the large servo-saver.

Sneak a peak at Team Losi's new killer

at the end of these arms are redesigned hub carriers specifically for use with the H-arms.

The transmission is similar to the unit included in the standard JR-X2, but again, there have been subtle changes to increase performance and longevity.

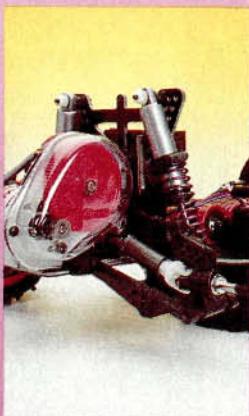
The upper shaft on the transmission no longer has a pressed-on brass gear. It's now drilled for an anchor pin and a removable nickel-steel upper gear that's so hard it should outlast the car. On

the outside of the new shaft is a redesigned spur gear that's supposed to create less drag and make much less noise.

Among other minor changes, the JRX-Pro also includes "Logo" dished one-piece wheels, a pair of the famous X-pattern tires for the rear and a pair of stagger-block front tires. The body is similar to the body included in the Proformance kit, with changes to the trim lines.

Though I haven't had a chance to test the Pro to see if these changes noticeably benefit the handling, I have little doubt that Losi is just throwing another version of the same old thing at us. By the next issue, the Pro will have gone through the paces, and I'll have the verdict—in vivid color—on how well this car performs.

*Here's the address of the company featured in this preview:
Team Losi, 1655 E. Mission Blvd., Pomona, CA 91766.

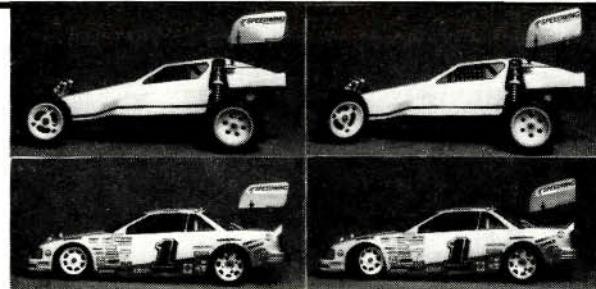


The rear suspension gets new hub carriers, stronger H-arms, rear shocks that are .3-inch longer, and a Pro shock tower. (Super slider shafts aren't included in the kit.)

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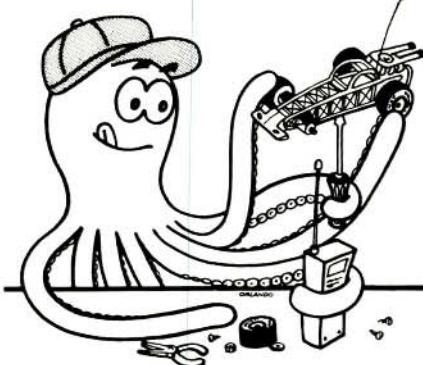
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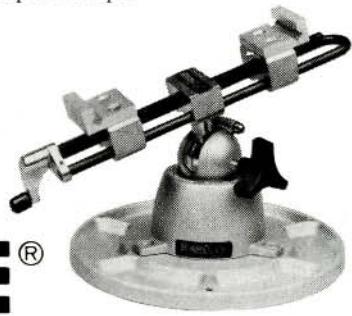
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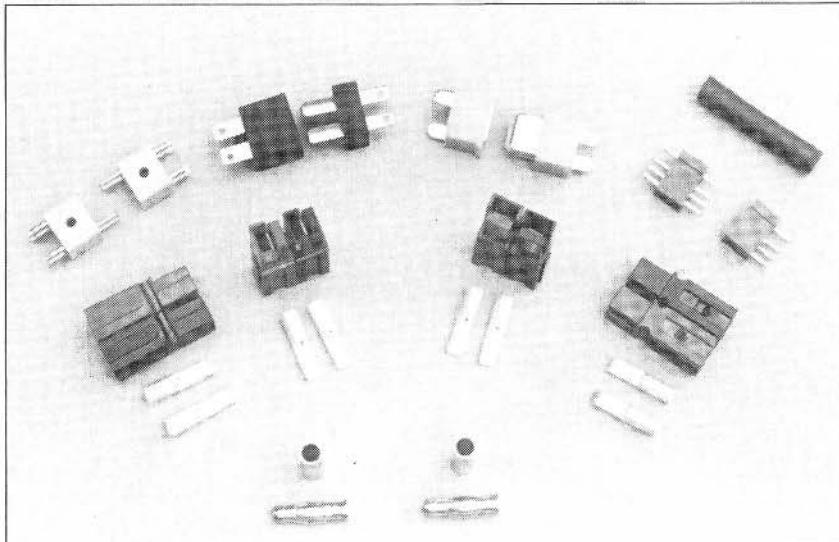
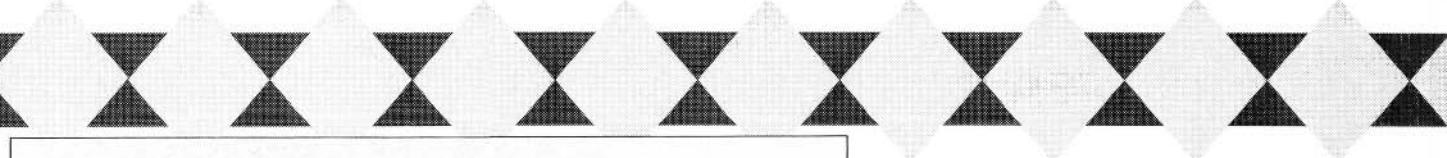
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The "trick" connectors included: (top row, left to right) Bold Creations PowerPipe/2, Trinity Power Plug, Race Prep Pro Connector, Deans Power Plug; (middle row) two sets of Sermos Power Pole connectors—the left pair is keyed for a motor; the right pair, for a battery; (bottom) Corally Battery Connectors: you can solder the round barrels directly to the battery and the mating male plug to the speed-controller wires.

THE TEST

To obtain voltage-loss data from the various connectors and wire types, I used the "Scoping Out" lab test equipment.

To determine resistance values, I used the method I use to test speed controllers: I passed a fixed amount of current through each item to be tested and measured the voltage drop with a pair of needle probes. With this information,

I calculated the resistance.

To ascertain the resistance of a connector, I took the readings 1 inch from each connector and subtracted the resistance value of the wire from the total resistance. Then, I multiplied the resistance value by two, because all connectors have two sets of contacts.

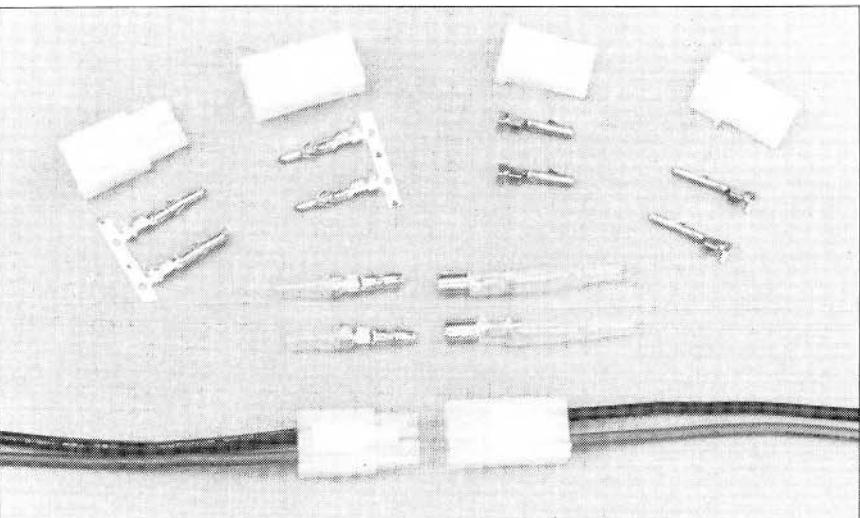
I used a 20A current value for the voltage-loss tests because it's the approximate amount of current that flows through an R/C car connector. I controlled the current with an adjustable resistor bank, and I measured it by measuring the voltage drop across a precision .01 ohm resistor.

THE VICTIMS

I divided the connectors into two groups: stock connectors and high-performance "trick" connectors. The stock connectors included the Team

Associated* Tamiya-style battery and motor connectors, and the popular "bullet-style" motor connectors. I also threw in a really cheap, generic version of the Tamiya-style battery connector. I crimped all the stock connectors onto the wires

because they're designed to be attached this way. (I could have soldered them but, almost without exception, a speed controller or battery with this type of connector is crimped onto the wire.)



The stock connectors included: (top row, left to right) Team Associated's Tamiya-style battery connector and a pair of Team Associated's battery connectors; (middle) the bullet-style motor connector; (bottom) a generic version of the Tamiya-style battery connector with 16AWG, plastic-coated wires that are crimped into place.

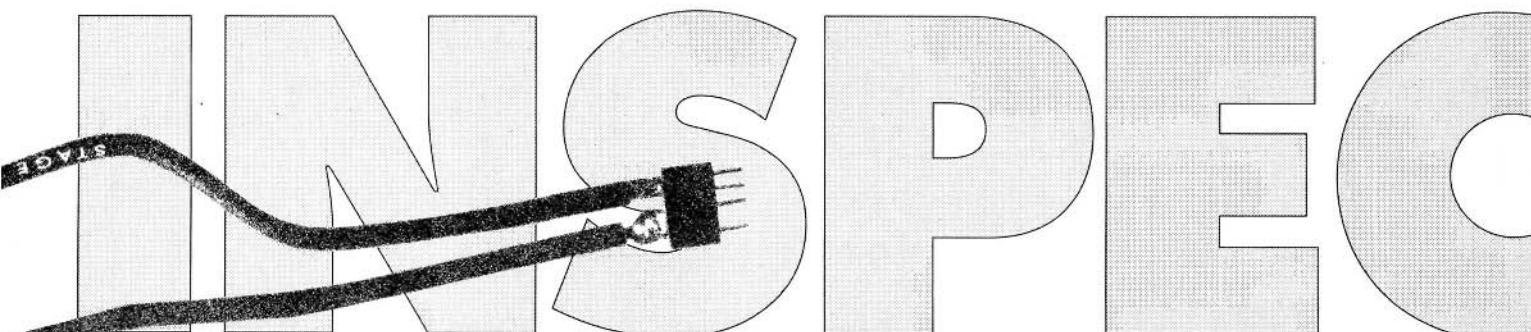
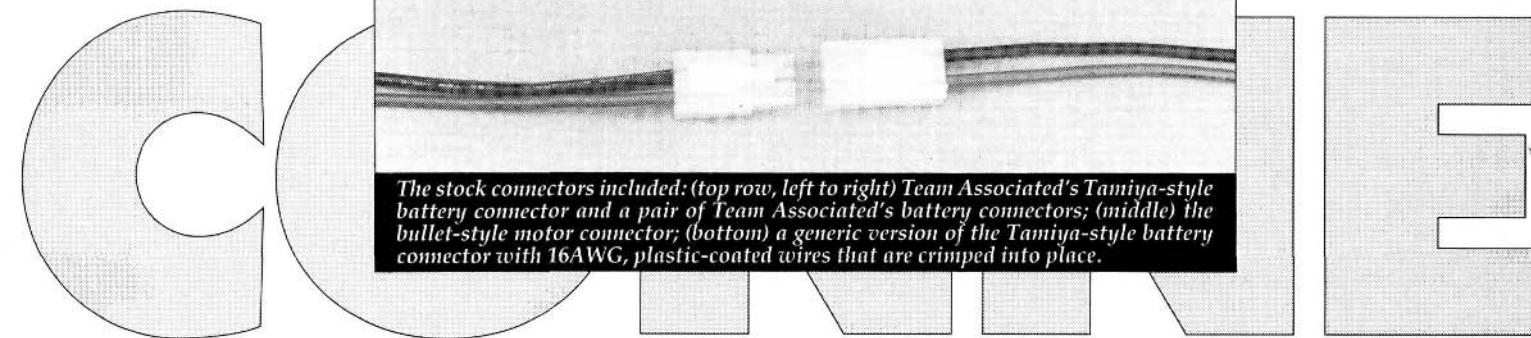


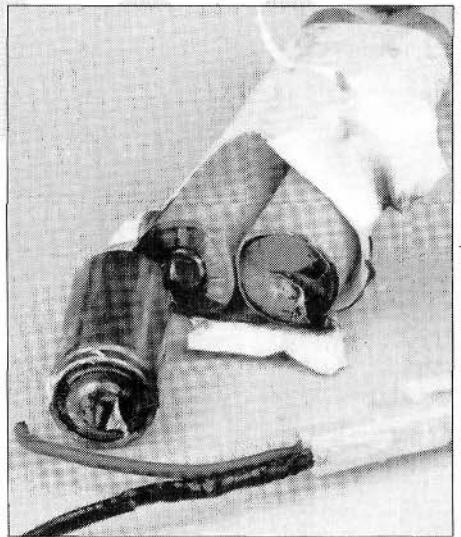
TABLE ONE

CONNECTOR TYPE	RESISTANCE	VOLTAGE LOSS @ 20 AMPS	PERCENT LOSS FOR 6-CELL PACK (7.5V)
Sermos Power Pole	0.0004 ohm	0.008 volt	0.1%
Deans Red Power Plug	0.0014 ohm	0.028 volt	0.37%
Bold Creations PowerPipe/2	0.0015 ohm	0.030 volt	0.4%
Corally Battery Connectors	0.0015 ohm	0.030 volt	0.4%
Generic bullet-style motor connector	0.0019 ohm	0.038 volt	0.5%
Trinity Power Plug	0.0019 ohm	0.038 volt	0.5%
Race Prep Pro Connector	0.0027 ohm	0.054 volt	0.7%
Team Associated motor connector	0.0027 ohm	0.054 volt	0.7%
Team Associated battery connector	0.0035 ohm	0.070 volt	0.9%
Generic Tamiya-style battery connector	0.0043 ohm	0.086 volt	1.1%

The high-performance connectors included Sermos* Power Pole Connectors, Bold Creations* PowerPipe/2 Connectors, Race Prep* Pro-2 Connectors, Deans* Power Plug Connectors, Trinity* Power Plug Connectors, and Corally* 1630 Battery Connectors. All are designed to be soldered to the wires, so I did.

THE RESULTS

Table I lists the connectors' resistance values starting with the lowest (the best) and continuing to the highest (the worst). All the voltage loss and resistance values are the combined totals of the negative and positive halves of each connector type (two contacts).



Smoke Test: be careful of dead-shorts across a battery pack! Deliberately plugging a string of connectors across the output of this battery caused this dead-short. The 16AWG wire and the generic connector couldn't withstand the short's 90 amps of current. Because the pack's welded-tab construction had such high resistance, the tab heated and melted through the end cell's covering. It shorted, and the pack covering caught fire.

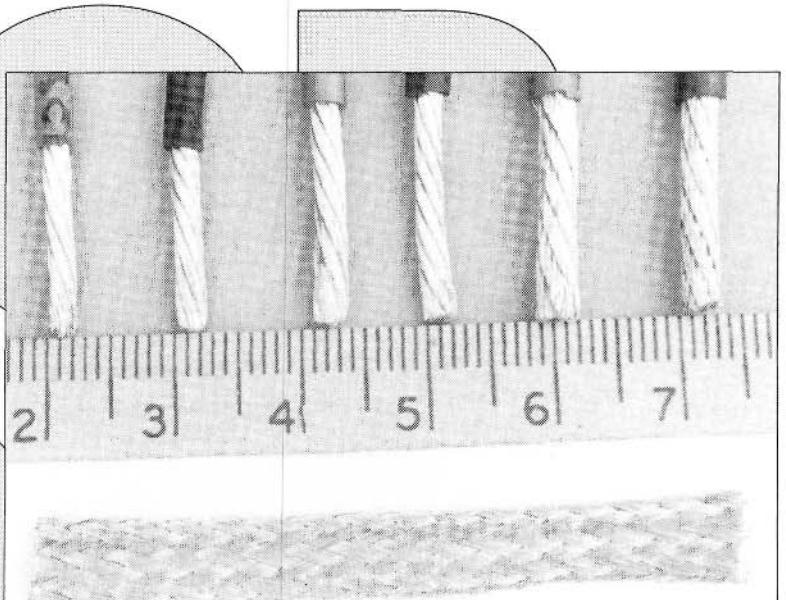
It's important to remember that if you double the current from 20 to 40 amps, you double the voltage loss and the percentage loss. Bad connectors hurt your holeshot because the current jumps sky-high when you put the pedal to the metal at the starting buzzer!

I wasn't expecting a tremendous performance difference between the various trick-class connectors, so I researched connector design and discovered that two major factors control a connector's resistance:

- the size of the contact area of the connector pins
- the resistivity of the contact surface.

During my research, I was surprised to discover that gold isn't the greatest conductor in the world. I looked up the resistivity of the three materials used in most connectors: gold, silver and copper. Silver is the best at 1.62×10^{-6} ohms/centimeter (see diagram). Copper is next at 1.77×10^{-6} ohms/centimeter. Gold is last, with 2.44×10^{-6} ohms/centimeter. So, the secret to the Sermos super-low resistance is a large silver-plated contact that's forced to lie flat against its mate by stiff, steel, backing springs.

Another interesting test conclusion is that all of the connectors withstood mating and de-mating well. I soaked them in hot salt water for 1 hour, and then I mated



The monster wire and braid included: (left to right) red and black Race Prep 13AWG wire; red and black Stage III Super 13, 13AWG wire; and Stage III Dragin 12AWG wire. Bottom: a sample of the 1/4 inch wide braid that's commonly used to build battery packs.

PHOTOS BY JOHN RIST

CONNECTOR INSPECTOR

and de-mated each one 100 times. I ran the resistance test again, and there was very little resistance change. In my experience, when exposed to the elements, the contact surfaces of connectors that use a pressure-type fit to hold the halves together (e.g., Race Prep, Power Pipe and Deans) eventually wear so much that contact pressure is significantly reduced. When it's reduced to a certain point, the connectors can no longer remain mated. Replace these types of connectors when you notice signs of a weak connection.

THE WIRE TEST

Connectors need wires, but wires have power-robbing resistance. You should keep the wires as short as possible, but it also stands to reason that "big" wire is better than "small" wire.

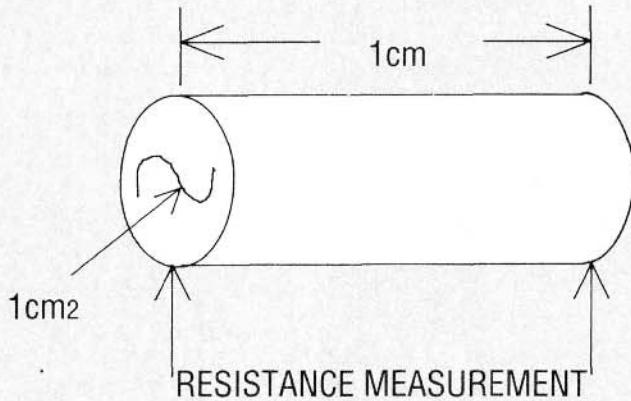
Table II lists the resistance of three sizes of wire—all very flexible, multi-stranded, silicone-coated wire that could be

stripped and soldered extremely well. The silicone insulations don't burn or melt when touched with a hot soldering iron. I've also included the resistance of some $\frac{1}{4}$ -inch braid that's often used to build battery packs.

In this category, I recommend Stage III* Super 13 wire, because it's the largest wire you can solder

TABLE TWO

WIRE TYPE	RESISTANCE PER FOOT	VOLTAGE LOSS @ 20 AMPS PER FOOT	PERCENT LOSS FOR 6-CELL PACK (7.5V)
Race Prep 13 AWG	0.000225 ohm	0.0045 volt	0.06%
Stage III Super 13 13 AWG	0.000191 ohm	0.0038 volt	0.05%
Stage III Dragin 12 AWG	0.000141 ohm	0.0028 volt	0.037%
Braid $\frac{1}{4}$ inch	0.000141 ohm	0.0028 volt	0.037%



A material's resistivity is measured in ohm(s)/centimeter. To find the ohm(s)/centimeters resistivity of a conductor, measure the resistance of a sample of the material in question. It should be 1cm long and have a cross section of 1cm^2 .

$$\text{Silver} = 1.62 \times 10^{-6} \text{ohms}$$

$$\text{Copper} = 1.77 \times 10^{-6} \text{ohms}$$

$$\text{Gold} = 2.44 \times 10^{-6} \text{ohms}$$

DEFINITION OF RESISTIVITY

into a Sermos connector without removing any of its strands. The Super 13 is 13 American Wire Gauge (AWG) wire and has approximately three times as many strands (each much smaller than usual) than the Race Prep 13AWG wire. This probably accounts for its slightly lower resistance.

The Stage III Dragin 12AWG wire truly has low resistance and massive current-handling capacity. You should use it in multiple-motor pulling trucks, drag-racing machines, or any application where you run what you brung, and hope you brung enough!

When I build a battery pack, I use $\frac{1}{4}$ -inch braid to strap the cells together. Although they're suitable for recreational use, commercially built battery packs with welded construction can have unacceptable power-robbing resistance for high-performance applications.

THE SMOKE TEST

I wired all the connectors in series. Then, I charged an old 7-cell battery pack that I use for practice. The pack was commercially assembled and has welded tabs between its cells. I

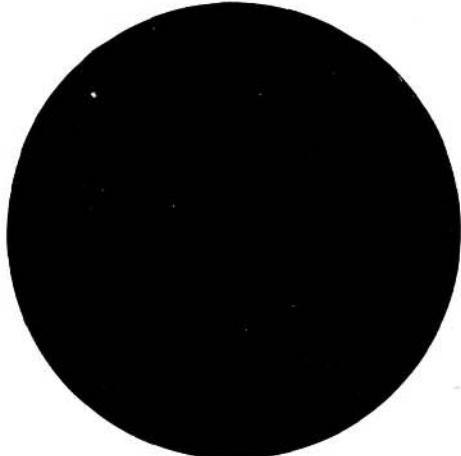
(Continued on page 198)

LETTERS

(Continued from page 86)

Roger, the easiest way to achieve crab steering is with the 3PB radio. With it, you can have separate servo control of both front and rear steering. More important, you can adjust the amount of throw for each servo independently. With a crab system, if both wheels turn exactly the same amount, the truck will never turn around. Instead, you'll only be able to move it right or left, with it always pointing in the same direction. To turn it around, one servo must have more travel than the other. With the 3PB, you can control all these adjustments and the crab or non-crab steering from the transmitter.

The difference between the servos is transit time and power. The S9301 is the new number for the old S131S (69.5 ounce/inches of power, .22 seconds/60 degrees); the S9601 is identical to the S135 (36.1 ounce/inches, .17 seconds/60 degrees); and the S132H is the fastest but least powerful (25.0 ounce/inches, .13 seconds/60 degrees). In a truck such as the Clod, the more power the better—so the S9301 is your best bet. JH



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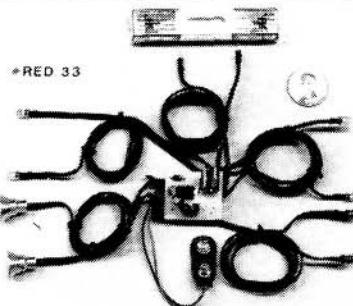
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TRACK REPORT



TAMIYA

SUPER G

by DICK BRINTON



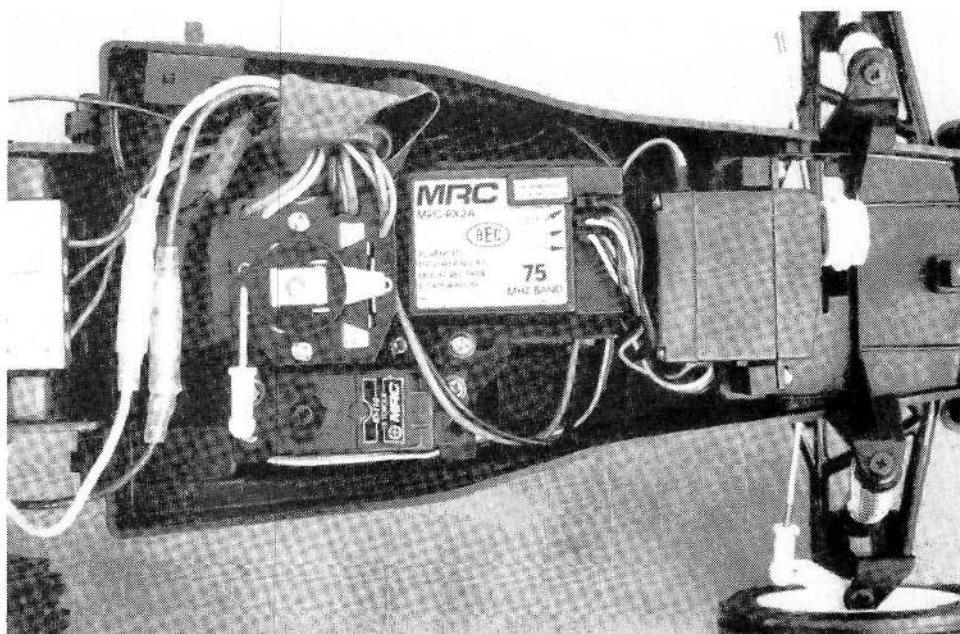
THE GRASSHOPPER HAS been around for a long time. This says something about the soundness of the kit's basic design and its quality. The car is simple and strong. No, it's not a racer in the usual sense, but when you run it against comparable cars, it's a ton of fun! The parts fit as well as those of any kit I've ever worked with—everything can be assembled just as it's supposed to be—and you end up with a car that's as close to unbreakable as an R/C car can ever be.

A NEW OUTLOOK

Sometimes, when we examine a kit that has been on the market for a while (even one that has been updated like Super-G) we take all its little details for granted because we're so used to them. Let's look at this car as if it has just been produced, and we've never seen it before.

When I open any kit, I first look for the instruction manual. (Well, maybe I look at the parts first!) Some instructions are written so poorly that I wonder which kit they refer to, but Tamiya* knows that good instructions are a necessity—especially in a kit that's made for new hobby enthusiasts!





The ABS-resin chassis is the same—it always held up well! The mechanical step controller has BEC.

PART-BY-PART

The manual lists the necessary tools and gives you information about the radio. This is basic information, but if you're a newcomer to the hobby, it's very helpful. The instructions start with the electrics, the radio test and the servo centering. Be sure to build this kit step by step (e.g., if you ignore the servo-centering steps, when you put the servos into the car they might not be centered, and you'll have to take the radio gear out to adjust them properly).

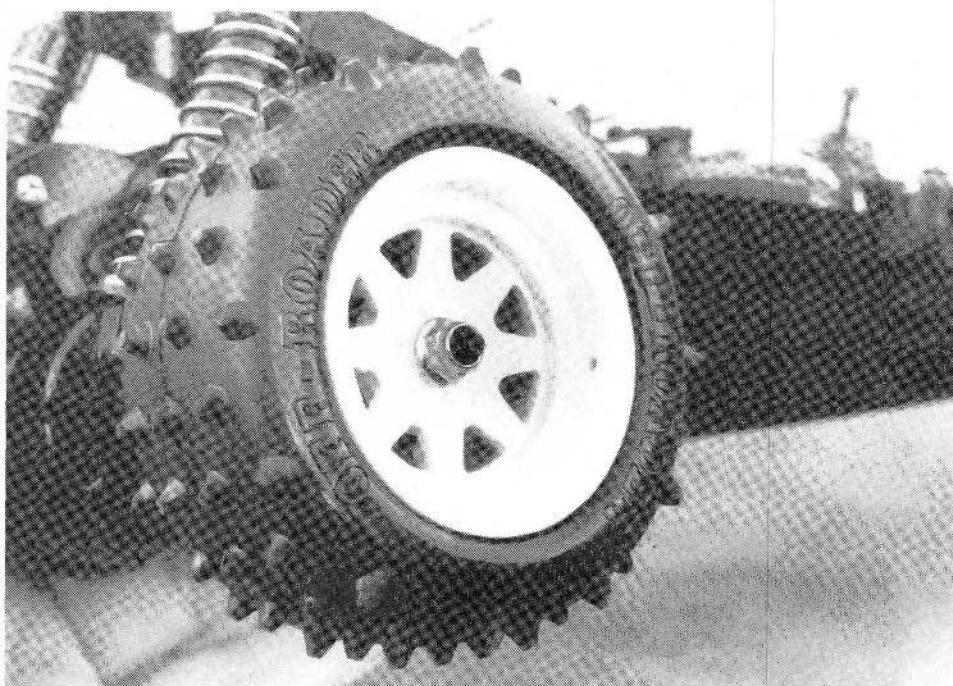
The part descriptions (printed down the left side of the manual's pages) are a nice touch. Most of the small parts are shown full-size so you can match them to the pictures to ensure that you use the correct ones. Believe me, it's a major nuisance to have to take a car apart just to remove a

screw that should have been used somewhere else. Matching the parts to the illustrations will prevent this.

WAY TO BUILD!

The base of the Super-G is a very strong polystyrene-resin tub chassis. All the radio parts and the electrics are inside the tub, which protects them from knocks. I was surprised that the servos were installed without the rubber grommets that isolate them from vibration, but I built the kit exactly as directed! (With one exception that I'll get to later.)

After installing the electrics, attach the front suspension. The A-arms are flexible, so they won't shatter the first time the car hits a curb or a rut. If, however, you're one of those who never read the complete directions before they start, this is where you'll find yourself putting on the old front shocks. On the other hand, if you read the directions first, you'll have marked the changes (starting on page 9 of the manual), and when you reach this point, you'll exclaim, "Ah-ha!—here's where I put together the oil spring/damper units...and look at this, there are instructions for mounting the 540 motor and the wheels. Look what I would have missed if I hadn't read the manual's supplement!" Is the supplement important? You bet! The changes described in it are what make the Super-G different from the Grasshopper!

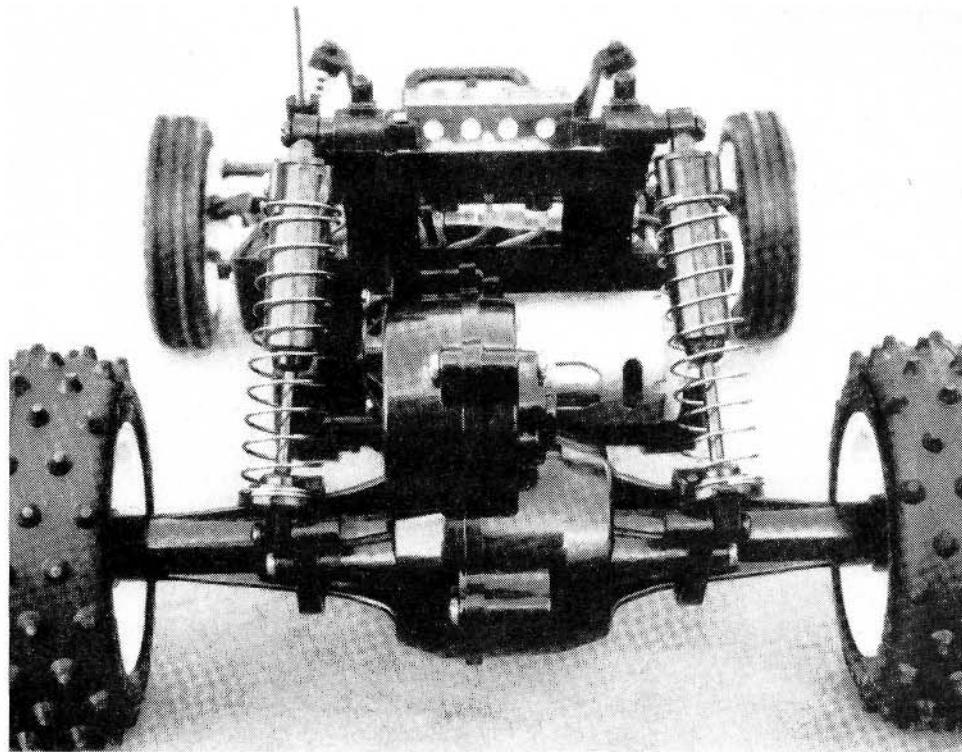


Low-profile spikes on one-piece wheels have replaced the high-profile paddle tires that were used on the original Grasshopper.

The kit comes with oil-controlled spring/damper units that greatly improve the car's handling. (Unfortunately, my kit didn't include the O-rings for the shocks, so I had to buy them from a hobby shop.) The completed units (filled with Tamiya "soft" shock oil) work very well and help to control the front and rear suspension, so this car handles a lot better than the Grasshopper. It needs the improved handling, too—the 540 motor pushes it a lot faster than the old RS 380 motor!

last very long, and I wish manufacturers would include metal bushings instead. The Super-G is a sturdy car and, with some care, it will last a long time—it deserves metal bushings!

When you get your Super-G onto the dirt, you'll have a car that handles well, has plenty of power and is as strong and sturdy as any I've seen! Stick a set of metal bushings (or bearings) into it, and go have fun! No, it won't win a race against a JR-X2 or an RC10, but it's a



A Mabuchi 540 motor replaces the original 380 equipment. The kit comes with oil-controlled spring dampers—a vast improvement! (See text.)

Like everything else in this kit, the tough, injection-molded body fits perfectly. You don't have to paint it, and when the decals are in place, it looks rad!

BETTER BUSHINGS!

Earlier, I mentioned a change from the manual. I replaced the kit-supplied nylon bushings with metal ones. If you've read any of my previous articles, you know that I don't like nylon bushings. They don't

tough customer that can withstand the abuse that any sandlot driver can dish out.

**Here's the address of the company featured in this article:
MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.*

TAMIYA

SUPER-G

Type 2WD off-road
Scale 1/10
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DIMENSIONS:

Overall Length 16 inches
Width 8.75 inches
Wheelbase 10 inches
Track (f/r) 7.375 inches

WEIGHT:

Gross (w/bat.) 3 pounds, 1 ounce

BODY:

Type Off-road buggy
Material Injection-molded plastic

CHASSIS:

Type Bathtub
Material Polystyrene resin

DRIVE TRAIN:

Type Pinion/spur
Differential Planetary gear
Bushings Plastic

SUSPENSION:

Front: Type Independent A-arms
Damping Oil-filled coil-over shocks

Rear: Type Live axle
Damping Oil-filled coil-over shocks

WHEELS:

Front: Type One-piece plastic
Dimensions (DxW) 2x.75 inches

Rear: Type One-piece plastic
Dimensions (DxW) 1.75x1.375 inches

TIRES:

Front Ribbed/knobby
Rear Knobby

ELECTRICS:

Motor RS540
Battery Req'd. 7.2V 6-cell stick pack
Speed Controller 3-speed forward w/reverse

OPTIONS AS TESTED:

Metal bushings.

COMMENTS:

Its great instructions make it good for beginners with great instructions. The longer A-arms definitely increase stability, and the oil-filled shocks are a substantial improvement over the older, undamped suspension. The 540 motor, which provides much more power than the old RS380 used in the original Grasshopper, is very reliable and still provides plenty of run time.

TROUBLESHOOTING

by STEVE POND

ILLUSTRATIONS by JIM NEWMAN

We've persuaded veteran illustrator Jim Newman to lend his talents to this column. He has been illustrating Radio Control Car Action's "Pit Tips" ever since the magazine started, and he has contributed regularly to one of our other publications—Model Airplane News—for more than 20 years! We love his work, and we're sure you will, too.

If you have a technical problem that your hobby shop or racing friends can't solve, give us a shout at Radio Control Car Action, and we'll see if we can find an answer. Questions should be technical and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



ROTATION RESOLUTIONS!

I recently bought the Hyperdrive belt system for my Associated RC12L. When I bought it, I knew that its rotation was reversed and, to install it, I'd have to reverse the polarity leading into the motor. When I did this, the Hyperdrive worked well, but speed was significantly reduced.

A few manufacturers market double-sided pods for 1/10-scale on-road cars, and I wonder if any of them make one for my car? I could flip the T-plate over, install all the other hardware and the pod, and my wheels would still be centered. Can you help me?

Brian Yoshino
Carol Stream, IL

When you use a Hyperdrive belt system, the axles and wheels rotate in the same direction as the motor instead of in the opposite direction with the pinion/spur assembly. To compensate for the change in axle rotation, you must reverse the rotation of the motor.

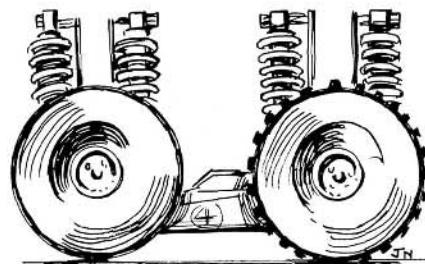
On any motor (stock or modified), it's a drastic mistake to simply switch the positive and negative leads. All motors have a certain degree of advanced timing (i.e. the amount, in degrees, that the

brushes and the endbell rotate in relation to neutral on the motor's magnets). Simply switching the positive and negative wires on the motor results in a retarded timing point. For instance, if you ran a 34-degree stock-class motor and the polarity was reversed, the timing would be retarded by 34 degrees. The result would be a significant decrease in performance and an increase in amperage draw.

The bottom line is that you must rotate a modified motor's endbell 180 degrees if you want to maintain advanced timing while reversing the direction of rotation. For stock motors, move the motor and motor-mounting plate to the other side of the car if it's possible (which it isn't on the 12L), or buy a reverse-rotation stock motor.

having to replace the cartridges more often.

If you've been using the cartridges that came with the car, chances are they're worn and should be replaced. It's best to pick up a few extra sets of cartridges so, in a month or two, you can replace them and prevent further leakage. The cartridges are very inexpensive, so don't be bashful about replacing them.



SUPER-BIG-SHOT?

I have a Turbo Optima Mid SE and a Supershot. The stock rear gears on the Supershot are slipping and clicking. Will a Thorp diff solve this problem, or will I have to buy new gears?

I want to modify my Supershot so it can take two motors (one in front, one in rear). I'd also like to use eight shocks instead of four and oversize tires.

Any information about after-market parts that will help me with this will be greatly appreciated. (Please don't say "Just drive it," that's what the Turbo Optima Mid is for.) Finally, do bearings wear out?

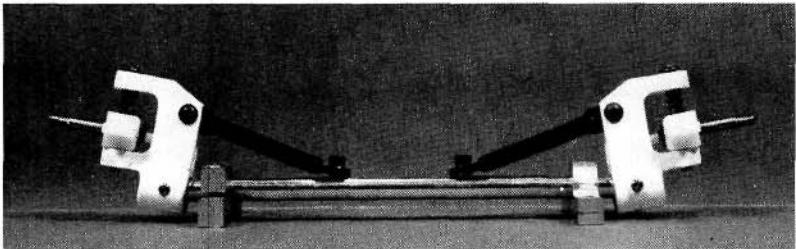
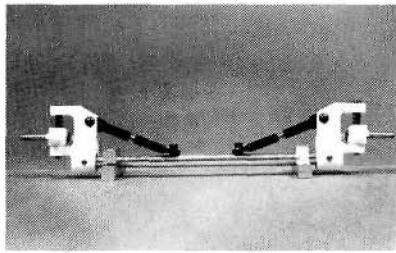
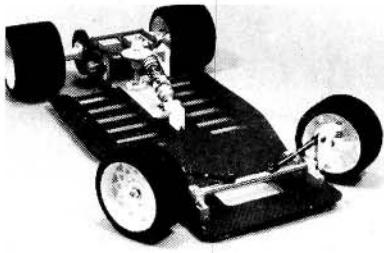
Craig Matt
Regina, Saskatchewan, Canada

I've had my JR-X2 for about six months. Whenever I fill the shocks with oil, they leak, and after a week, they're only one-quarter full. I use the stock oil, and I've had this problem since the car was new. What's wrong?

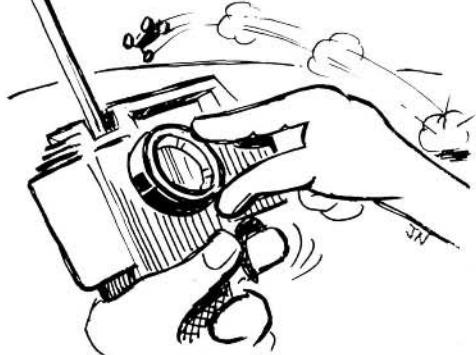
Shawn Pavluk
Kamloops, British Columbia, Canada

The JR-X2's shocks, as well as the rest of the car, are designed for all-out competition. The cartridges are just tight enough to provide a seal and prevent oil from leaking, while allowing as little friction as possible. The adverse effects are obvious: the cartridges begin to leak sooner than the average shock absorber. Team Losi, however, thinks that their performance advantage outweighs the inconvenience of

If the slipping and clicking is coming from the stock differential, then replacing it with a Thorp diff will solve your problem. Don't, however, be too quick to dismiss this as the problem. The bad gear(s) might not be in the diff. Check all of the gears in the drive train, and if you determine that the problem is in the diff, by all means, replace it. One way or the other, it sounds as if you have a worn-out part that should be replaced.



As for converting your Supershot into a twin-motor monster, my only suggestion is that you should find out if you can fit another Supershot rear assembly to the front end. If so, simply reverse the rotation of the motor you use in the front end (or buy a pair of Clod Buster motors), and you'll be all set!



SPEED-CONTROLLER SORROWS

I have a Kyosho Hi-Rider Corvette. When I press "forward" on my Pulsar 2000 controller, it goes, but it won't stop, and the "reverse" rarely works. I figured that its servos needed to be adjusted, but my cousin says there's something wrong with the speed controller or the driving servo. I'd like to know what's wrong.

Tim Lindaver
Dyer, IN

Start by inspecting the speed controller. Remove its top, and make sure that the electrical contacts are reasonably clean and lubricated with an electrical lubricant. If the contacts are dry and pitted, the rotor on the speed controller will bind, and it might even get stuck in gear. For minor pitting, clean the speed controller's contacts using 200- or 400-grit sandpaper. A few light passes to remove discoloration should do the trick. If you have heavy pitting and melted electrical components, it's time for a new speed controller.

Another problem might be that the servo has "gone bad," or was poorly made to begin with. Often, the cheaper servos don't return to dead center when you release the throttle. This might leave the wiper touch-

(Continued on page 108)

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TROUBLESHOOTING

ing the contact(s), and this would keep the motor running. A quick check should tell you whether the servo returns to center.



MORE MODS?

I've owned an Ultima II for about two months, and I have a Magnum Jr. and a T-4 speed controller. I want to move up from the stock to the modified class with a few modifications or hop ups. I started with a cheap battery pack—the first one I had, worked, but when I bought a new one, it didn't. By next month, I should have enough money for a Magic Speed Joel Johnson Motor, a Trinity SCE pack and gold shocks. Do you think that I have enough, or do I need more?

*Greg Bryant
Jamaica, Queens, NY*

It sounds as if you're headed in the right direction with your list of parts, but let me suggest some other accessories.

The Ultima II is a very good car, but you might want to replace the Kelron chassis with a more rigid graphite one or add an aluminum lower plate one. This will prevent the potential chassis flexing that's common in modified racing.

The gold shocks are a great addition, but I suggest that you use the black shocks that came with the car until they're worn out—they work fine.

As far as the battery goes, unless you're on a really demanding track, SCE batteries aren't necessary. The SCR cells (especially the new 1400mAh Sanyos) provide plenty of power and are ten times more reliable than the delicate 1700s.

Adjustable upper links and steering linkages are also helpful when it's time to make some adjustments. Titanium turnbuckles such as those from Tecnacraft, RCPS, or Lunsford are my choices when it comes to linkages.

With these modifications, you should have all the car you need to get to the A-main. Just remember: you don't need to spend a lot of money to go fast. Throwing parts at your car only costs you money; the way to go fast is to practice driving and tuning your car!



BENT DIFF SHAFT

I own an RC10 with a LeMans 360ST motor. My problem is that the diff shaft in my car's transmission keeps bending and, as a result, the 32-pitch spur gear keeps slipping out. Hope you can help.

*Chad Morris
South Fulton, TN*

I've been running an RC10 on and off for about five years now, and I haven't bent a diff shaft yet. In fact, I contacted Cliff Lett at Associated Electrics to see if he could shed some light on your problem, and we both drew blanks. We did, however, come up with a number of possible causes of your problem.

First, be sure that the transmission is assembled as the instructions recommended. If you're sure that it is, check the diff shaft and the gears that are attached to it. One of the holes in the gears might have been drilled off-center, and this might have caused the shaft to bend.

Debris in the transmission, such as a broken tooth, could become lodged in the gears and also cause the shaft to bend. Another possibility is that, when you use a small pinion gear, the grub screw that holds it on could be touching the spur gear.

As you can see, there are several possibilities. To help diagnose the cause of your problem, recruit an experienced RC10 racer (it's very tough for me to make suggestions without seeing it). If you don't have any luck there, call the Team Associated tech hot line, (714) 850-9342; they'll help you solve the problem. ■

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THUNDERDROME

(Continued from page 98)

This set the stage for the A-Mains in each class: top drivers from around the country would go at it head to head in what promised to be the race of their lives.

Starting with A-Main in the Road Wizard Class, Bill Ranier jumped out to an early lead with his OM 10 and never looked back as he took a decisive win in the class with the only 19-lap run in the Main. Following in 2nd was Jim Collis with the only Lynx II car in the field. Collis was followed closely across the line by Jordan Carpenter and Steve Penimore, who waged a three-car battle for the 2nd-

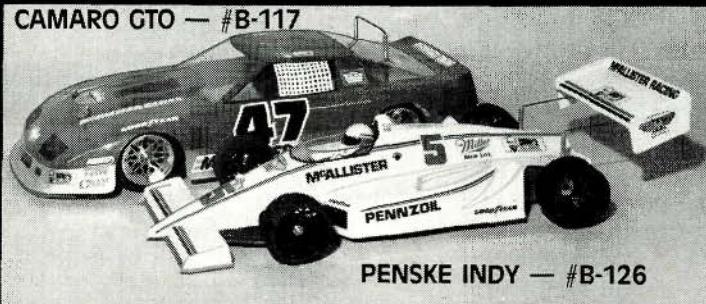
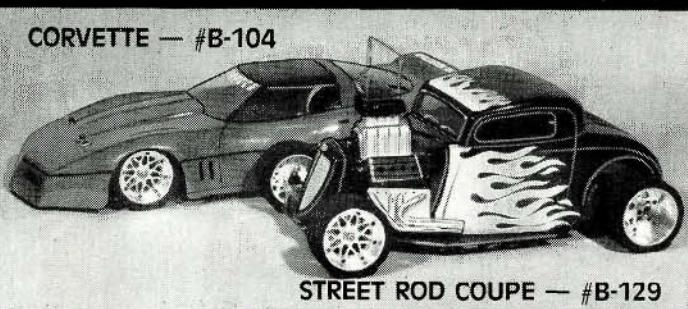
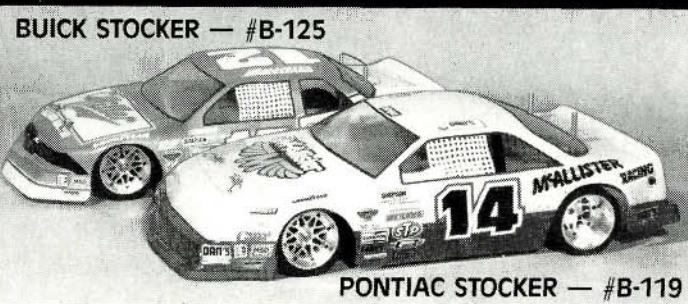
(Continued on page 126)

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BIG B GOES INDEPENDENT



Introduced in '86, the Frog was the first Tamiya car to break the solid-rear-axle tradition in favor of 4-wheel independent suspension. Its chassis is still produced today, and it's used in the Blackfoot and the Mud Blaster.



Futaba's original Magnum R/C car radio system was the most advanced of its time. Its features included some of those you'll find on more contemporary radios, e.g., dual rate, exponential and servo-reversing. The old Magnum even had a warm-up feature for gas-powered vehicles and a swiveling head for left-handed drivers!

Unsung ORIGINAL

Although the Blackfoot is often credited with being the first 2WD Monster truck, in reality, the Marui Big Bear was the first.



Yokomo posed a threat in the race for 4WD supremacy.

YOKOMO

WHERE HAVE ALL THE IMPORTS GONE?

In '87 and '88, there were more 1/8-scale off-road cars available from various parts of the Far East. Cars like the CMW Puma, the Kyosho Vanning and the Varicom Silver Fox are no longer imported.

METAL MONSTER

The Tamiya Bruiser was the first 4WD truck to gain popular acceptance. Although out of production, its unique metal suspension, frame and drive train make it sought after today. It was featured in the first issue of Car Action—Winter 1986!



5 YEARS of CAR ACTION

...and the beat goes on

During the five years since we introduced ourselves to you with the Winter '86 issue, R/C car racing has developed into a highly diversified hobby. It has been difficult to keep up with the hobby's rapid metamorphosis—the latest trends, events and new product releases—but we always try to

give you what you want (hey, c'mon!—within reason!). We care about our standing with you, so keep writing to us for another five years because we're listening—we have to!

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SO LET IT BE WRITTEN!
SO LET IT BE DONE!

The first issue of Car Action; things would never be the same again! Dealing with the competition was like shooting a rabbit with a cannon!

Unchallenged



Since the Winter of '87/88, the Tamiya Clod Buster has been the 4WD monster to beat; only the recently introduced Kyosho USA-1 poses a possible threat.

WILD & CRAZY

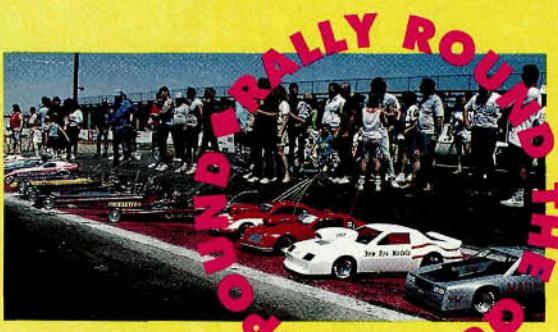
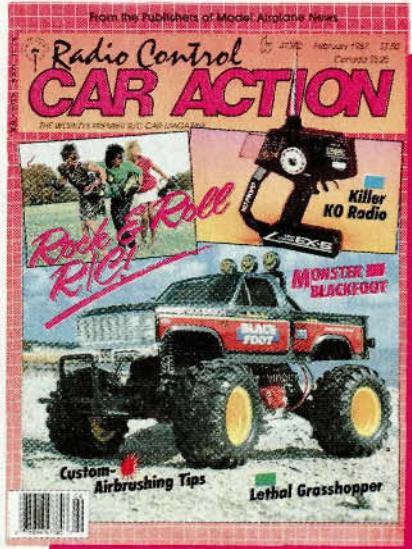


Ever since the first issue of *Car Action*, we've featured the creative modeling efforts of our readers—some just completely off the wall.

Pictured here is Gary Connelly's 1/4-scale Deuce coupe with an operational mini V-8 engine that we featured in the premier issue. Dave "Rocket Man" McNattin blew our minds with his rocket-powered Kyosho Plazma (featured in July 1988)! If it's R/C guided, we'll feature it!

THEN THERE WAS FOOT!

The Blackfoot—a major catalyst in the monster-truck movement—made its memorable debut in the month that *Car Action* became a bimonthly: February '87.



In Fall '87, 1/4-scale rails came of age—cars from companies like Performance Drag Products, Pacesetter and New Era. Some of these companies are now defunct.

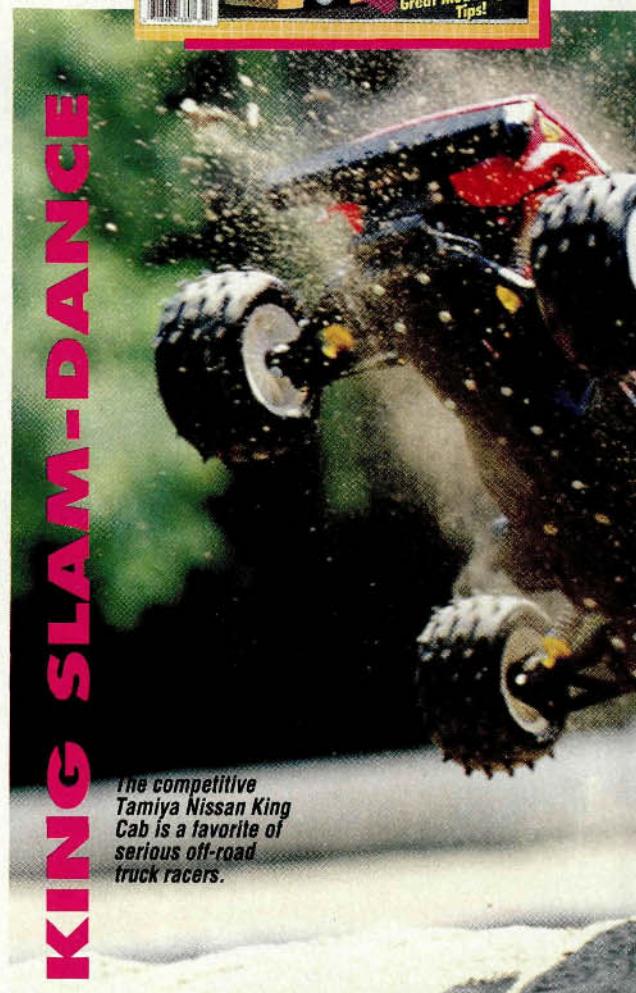
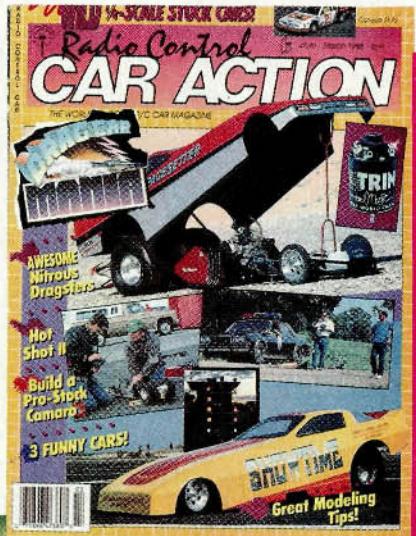
sizzling
GRIZZLY



Featured in the Summer '86 issue of *Car Action*, the Pacesetter 1/4-scale Grizzly was one of the first commercially available off-road racers. *Car Action* was still a quarterly—Summer 1986.

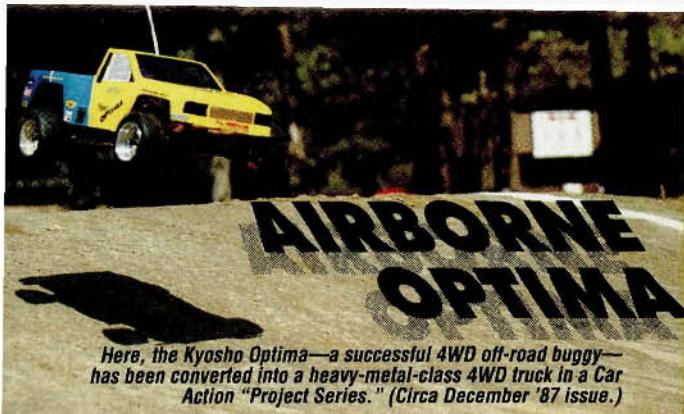
MARCH '88 DRAG SPECIAL

To fuel interest in the relatively new sport of drag racing, we devoted the March '88 issue to it.



KING SLAM-DANCE

The competitive Tamiya Nissan King Cab is a favorite of serious off-road truck racers.



Here, the Kyosho Optima—a successful 4WD off-road buggy—has been converted into a heavy-metal-class 4WD truck in a *Car Action* "Project Series." (Circa December '87 issue.)



BUGGED-OUT FROG

Decked-out, souped-up off-rovers like this Project Frog became quite common in the pages of *Car Action*. This series showed how to get the most out of many cars. Many "Project Series" cars were featured during '87 and '88.

CHANGING the GAME

The entry-level game has changed a lot over the past few years, becoming more technically sophisticated.

This Kyosho Raider with its upper control link and fully independent suspension is a good example.



1/10-SCALE TIME

Kits like this Fine Design Funny Car allowed people who didn't have much time or skill to scratch-build a 1/10-scale electric dragster and then get in on the action!

THE MODEL-T OF R/C



by CHRIS CHIANELLI

It's not unusual to find turnbuckle upper links and low-profile tires on today's entry-level cars, which have certainly changed over the past few years. New-found consumer awareness has apparently led to an agreement that "live" rear axles and "air shocks" are no longer acceptable. We now get more of a high-tech car for approximately the same price, and we rarely need to buy that second, more advanced car as we progress. We shouldn't, however, forget the cars that gave many of us our first taste of R/C racing excitement. Two such trusty vehicles are the Tamiya Hornet and the Grasshopper (see photo).

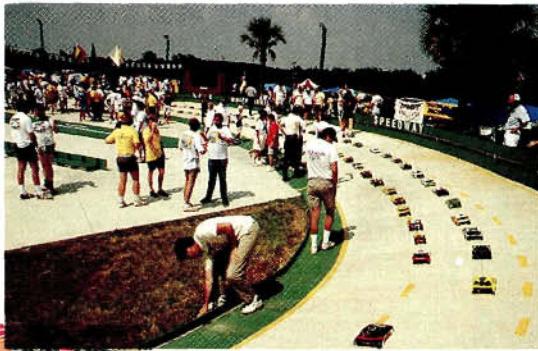
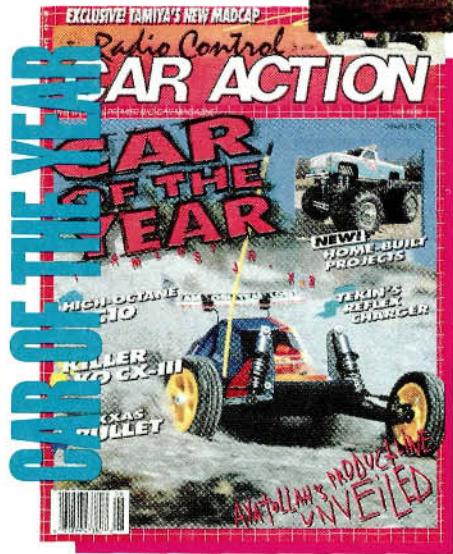
These cars were basically the same, but with one big difference: the Grasshopper had a Mabuchi 380 instead of the standard 540. These simple cars with their solid rear axles (which carried the motor as unsprung weight), hefty ABS, molded, tub chassis and single A-arm front suspensions served their purpose well and are still being used by feisty fun-seekers.

Hornets and Grasshoppers have been raced off-road and on-road, converted to monster trucks and raced off-road, made into hot-rods, dragsters and even a mobile rocket launcher! (but I won't go into that!). Their design has been ripped off by more manufacturers than any other, and there must be a good reason! The Grasshopper and the Hornet can be affectionately referred to as the "Model-T" and "Model-A" of R/C. We're forever indebted to them because they started the excitement rolling and have bounced their way into our hearts.

SUPER-SPEEDWAY . . . HERE TO STAY
 The February '89 issue marked the Second Annual *Car Action* Weekend at Lake Whippoorwill Speedway in Orlando, FL. High-banked-oval stock-car racing was in full swing!



5



OVAL ACTION BUILDS

The concours lineup at the second Car Action Weekend had more than twice as many entrants as the first year. New bodies and other speedway stock-car products were being introduced at a feverish rate. High-speed oval racing remains healthy.



IN THE FALL OF '85, when the premier issue of *Car Action* was in its final production stages, high-profile tires and Tamiya Bruisers were "state of the art."

In the June '90 issue of *Car Action*, the JR-X2 was named "Car of the Year." This Losi 2WD off-road machine was the most serious threat ever posed to the Associated RC10, which took the honors in '88.

The Bruiser is still a sought-after, collectible, metal-framed monster that today occupies its own spot in R/C car history. High-profile tires don't have quite the same place in our hearts; we're glad they're gone!

During the past five years, we've seen many examples of both success and failure, but the evolution of R/C cars has brought us a diversified hobby that's responsible for maintaining the high level of interest that has kept things so alive.

Off-road truck racing is rapidly becoming one of the most popular forms of R/C racing. This is partly because it so closely resembles the full-scale Mickey Thompson Stadium event seen on cable television. All the major R/C car manufacturers have introduced racing trucks.

OFF-ROAD- ING NOW AND THEN

Five years ago, off-roading was the main attraction, and it re-

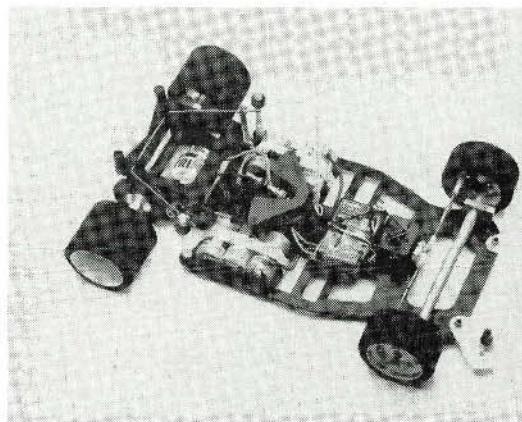


1ST RC10 CONVER- SION

Introduced in '88, the JG RC10 conversion kit was the first of its kind, and it sparked much interest in the off-road truck racing that's so popular today.



Beasts like this sled-pulling Clod Buster adorned with chains and lots of other modifications attract big audiences.



ONE LARGE STEP FOR...

BY JOHN HUBER

—yes, really! I'm sure Associated's RC10 was as big a milestone for R/C cars as the moon landing was for earthlings. (The first time I saw one, I was still driving my Sand Scorcher and thinking it was "trick"!) The RC10 was the first car that was *designed* to be adjustable: you could control its caster, camber, ride height, damping—and more! Its shocks redefined suspension as we knew it. (Other cars had oil-filled shocks, but none actually performed as well as these.)

The RC10's other major contribution was its ball differential, which,



mains so today. The difference is that eager newcomers to off-road racing now have far more choices of cars and equipment. In the past, if you wanted to race in the 2WD class, you ran an RC10 (the first car to have a ball diff); 4WD was completely dominated by the Yokomo Dog-fighter (then distributed by Losi), and the Kyosho Optima Series was just starting to make its presence felt.

Electronic speed controllers—a concept we were all just getting used to—were made by only a few manufacturers. Among the first to increase consumer awareness and eliminate the idea that they were gadgets built in

home “laboratories,” were Novak and Futaba (with its whopping 30-amp-surge-capacity MC8).

Over the past few years, I’ve often heard, “entry-level racing is dead,” but that isn’t quite

accurate. The entry-level car has evolved into something very different—something much closer to a competitive car. As a result, many dealers were stuck with outdated beginners’ cars, so for them, entry-level was, indeed, “dead.”

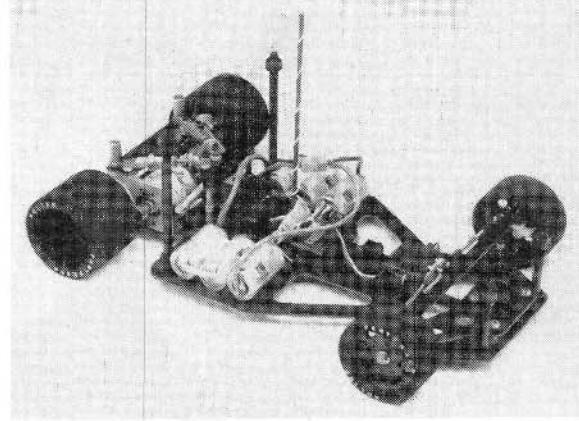
In the winter of

’87/’88, Kyosho introduced a car called the “Raider.” This car, which could sometimes be bought for as little as \$80, had a few features that hadn’t been previously seen on relatively inexpensive, entry-level cars like the Hornet and all its mimics. So what was

new?—independent rear suspension with upper control links (instead of the widely used “live” rear axle) and a pan chassis with a precise amount of front caster molded-in (an amount that looked conspicuously close to that of an RC10).

The Raider could

RC10, the JR-X2, or the Ultima. Tamiya—the king of entry-level—is well into replacing its line with cars like the Astute and Egress, which have many of the most sought-after race features.



PAN CHASSIS, ANYONE?

1/10-scale on-road pan chassis became very popular in '88 and '89 at high-speed oval events like the Car Action Weekends at Lake Whippoorwill and Thunderdrome. Here are three of the chassis often found on cars at these superspeedway races: (from left) the TRC/CompositeCraft Lynx II, the Associated 10L and the Bolink Eliminator. All are American-made, as are most T-plate pan chassis.

along with its shock absorbers, led the way to faster cars with modified motors. Six years after its introduction, we still see many RC10s in big races.

The car has undergone some changes over the years, and there are hundreds of after-market parts available—so many that it isn’t unusual to see an “RC10” that doesn’t have *one* stock part—mine is proof. The car has become a “building block,” and all you’ll see of the original is the hole pattern in the chassis.

I can’t imagine that we’ll ever again take as large a step as when we moved from the Sand Scorcher to the RC10. If we boldly go where no R/C car has gone before, we’ll just have to see what happens!

still only be brought to a certain level of competition, but it did mark a new era of entry-level—one that has been followed by increasing beginner awareness. Educated buyers have been responsible for closing the gap between entry-level and competitive cars. It’s more usual to see rank beginners going right to the

DIVISION IN THE RANKS

While off-road was evolving, many found other cars and contraptions in which to put their radios, and the on-road, electric pan-car was clearly a favorite. Again, the purveyors of doom loved to say, “1/12-scale on-road is dead”—this time, it was true, mainly be-

5

cause it was replaced by the more tractable 1/10-scale version. Half a story is never accurate!

Now, 1/10-scale paved-oval racing is one of the most popular types of R/C racing (witness the success of the *Car Action* Thunderdrome Lake Whippoorwill Superspeedway series). Watching 1/10-scale stock-car bodies splashed with bright sponsor colors streaking around the high-banked speedway is truly a favorite American pastime, and 95 percent of these 1/10-scale on-road cars are also *made* in America. Cars like the TRC Lynx, the Bolink Eliminator and the Associated 10L have led the pack of 50mph+ speedway machines. It isn't surprising that 1/10-scale banked-oval tracks can now be found all over the country.

Two slightly less popular—but nonetheless interesting—facets of R/C electric competition are sled pulling and 1/10-scale drag racing, which experienced a noticeable growth in '88 and '89, when companies like Fine Design cars and Black Magic motors came to the fore. There are drag-racing "hot-spots" around the country, all with groups of devoted followers, but the future of this sport is still unclear.

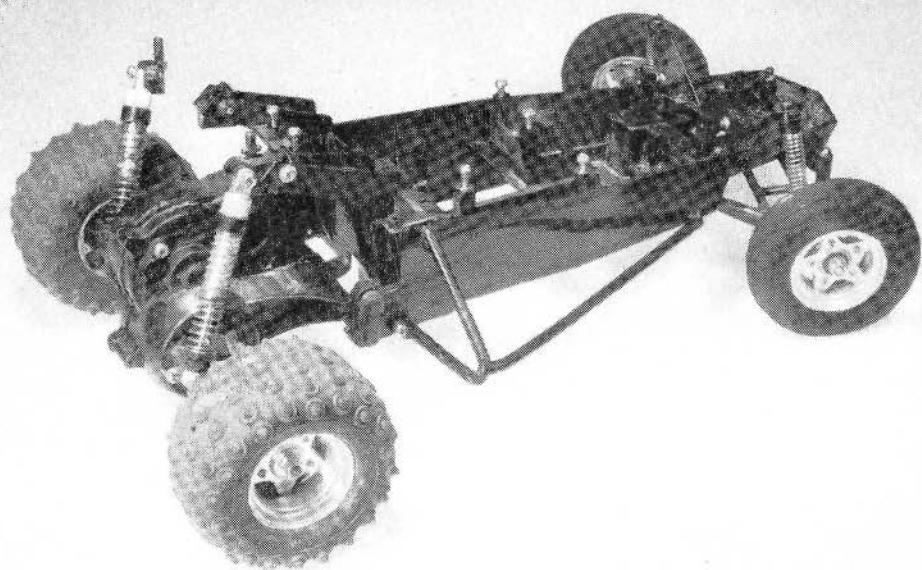
The future of sled

pulling, however, seems more promising—perhaps because the R/C competitions so closely emulate full-scale events. Fascinated audiences enjoy seeing these R/C 2WD and 4WD Sumo sled slingers do their thing, so sled-pulling safety is sure! We now have a solid product line with manufacturers like PDI Turbo Zeta, Astro Motors and Stormer reduction units so strongly identified with sled pulling that it's hard to talk about this event without mentioning their names.

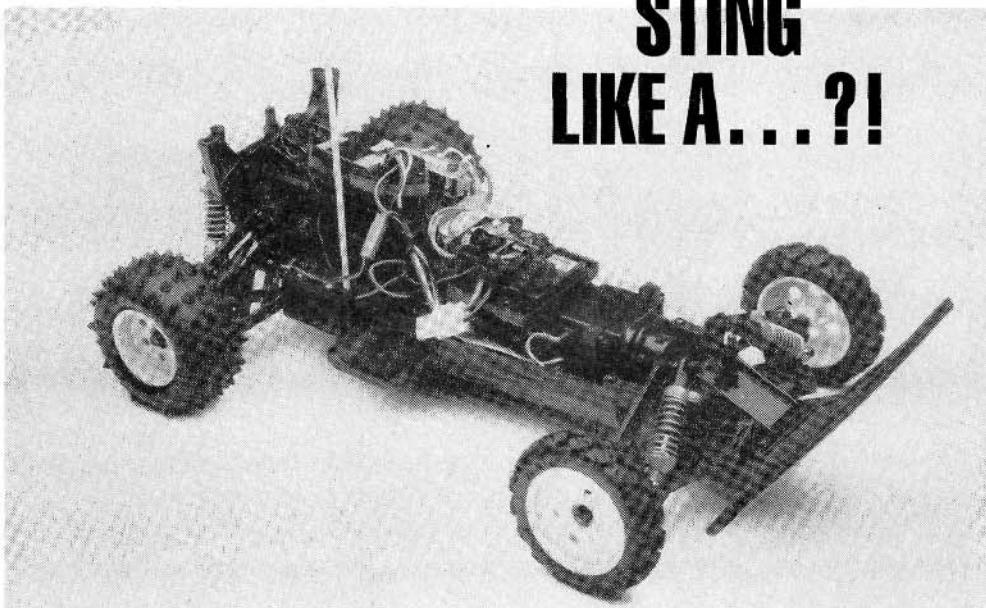
THE JURY IS OUT!

A few aspects of the hobby have, to be blunt, stagnated. In the '70s and early '80s, 1/8-scale gas racing in its two main forms—on-road and off-road—enjoyed more attention, but the industry was much smaller then. Interest in 1/8 scale has already peaked (probably

HOP LIKE A GRASSHOPPER,



STING LIKE A...?!



even died a little), but it still has its fervent followers, particularly in the West and Midwest.

Why hasn't gas grown like other segments of the hobby?—probably because gas-powered glow engines are noisier (leading to complaints from neighbors!) and take slightly

more time to deal with—time that many of us are unwilling to spend! We don't think it will ever be as popular here as it is in Europe, and it will never be as popular as electric car racing.

A somewhat similar
(Continued on page 256)

Early and later entry-level cars. Top: the Tamiya Hornet/Grasshopper design was copied more than any other in R/C history! It was durable, easy to maintain and enjoyed tremendous after-market back-up. Bottom: the Kyosho Raider, introduced a year after the Hornet, offered fully independent suspension, mid-motor mounting position, upper control link and molded-in front caster angle similar to that of the Associated RC10.

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THUNDERDROME

(Continued from page 110)

place spot. A door-to-door race for the entire 4 minutes had the crowd standing as Collis managed to stick his neck out

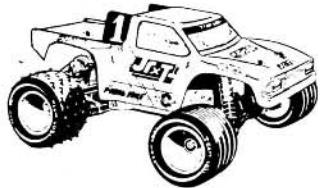
over the line to win the three-car battle over Carpenter and Penimore in that order.

The Modified A-Main was equally captivating, but this was a battle for the 1st-place spot, and it lasted the duration

of the event. Randy Moller, who had the TQ spot for the A-Main, held on to his lead right off the starting grid, but his position didn't go unchallenged, as the 3rd-place qualifier Mike Boylan followed him right into turn 1.

(Continued on page 134)

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SMASH or TRASH?

by FRED MURPHY

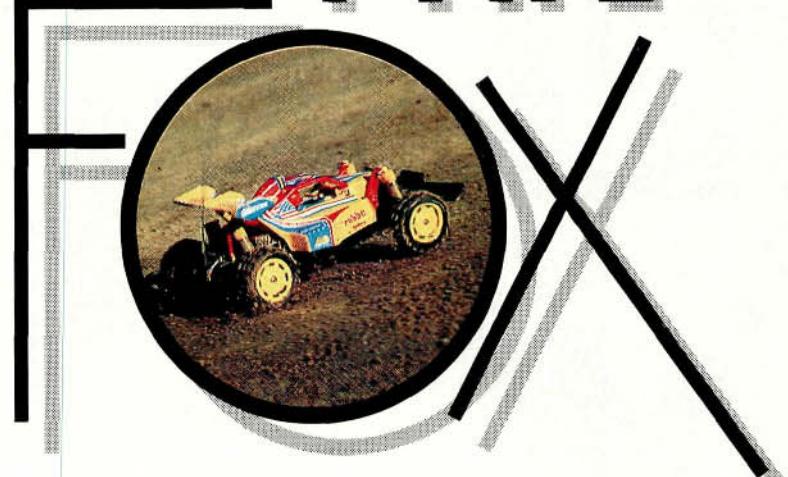
READY - TO - RUN" R/C cars have been profitable for many companies, and they have attracted new fans to the hobby—people who don't want to spend hours on assembly. Robbe* now offers a fully assembled, 1/10-scale, 4WD off-road car—the Firefox! You hit the dirt after completing only four steps, which include the installation of the radio system (not supplied); but before we get to that, let's look at what makes the Firefox ready to run.

THE KIT

The Firefox has a center drive shaft and two differentials that look like those on the once-famous Tamiya Big Wig. The differential has a spur gear, a bevel gear and an idler gear—a proven design that's enough for the entry-level Firefox. The diffs come completely lubricated, so you won't have to open these sealed units. As for replacement gears, Robbe offers only a fully assembled unit, which increases the cost of

replacing the broken part. This does show, however, that the company is trying to make things as easy as possible for newcomers to the hobby. No mess and no wasted time; just a clean, simple replacement.

ROBBE FIREFOX



PHOTOS BY YANNI SUEZ

The Firefox comes with double-wishbone front and rear suspension, which works with four oil-filled, coil-over shocks that give all-terrain capabilities. The spring tension is adjusted by adding a variety of spacers.

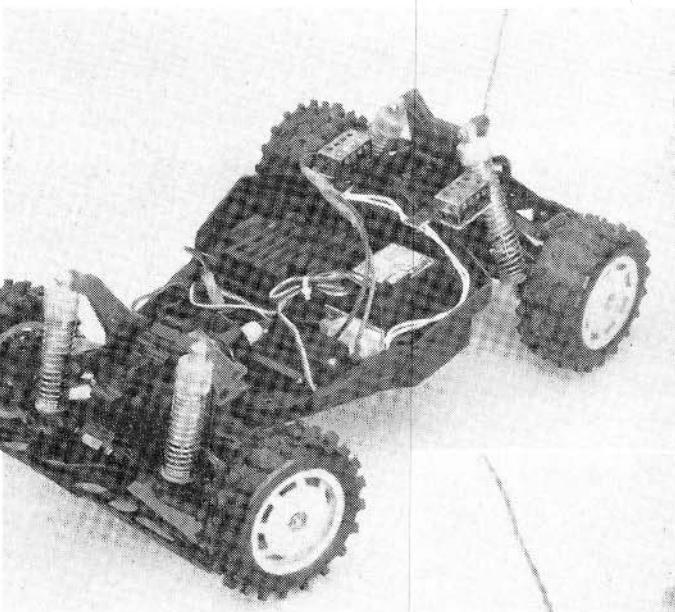
The suspension and differential units are attached to a bathtub-type ABS plastic chassis, which protects the Firefox's all-important electrics. We all know there are puddles and obstacles that not even the biggest

trucks can clear. The bathtub chassis is the only way to protect the radio gear.

The Firefox has four, large, stud tires and a protective, full-width front bumper, and it's controlled by the popular 540 Mabuchi motor and a three-speed controller with two external resistors. A 6-cell flat battery pack is recommended, and this is housed in its own compartment under the chassis. You'll have to install the steering servo, the speed controller and servo and the receiver.

Before installing the electronics, remove the front-axle assembly by unscrewing four screws and disconnecting the steering arms. When you've tested and centered your radio system's servos according to the instructions, install the steering servo by putting it into the formed holder and securing it with two screws.

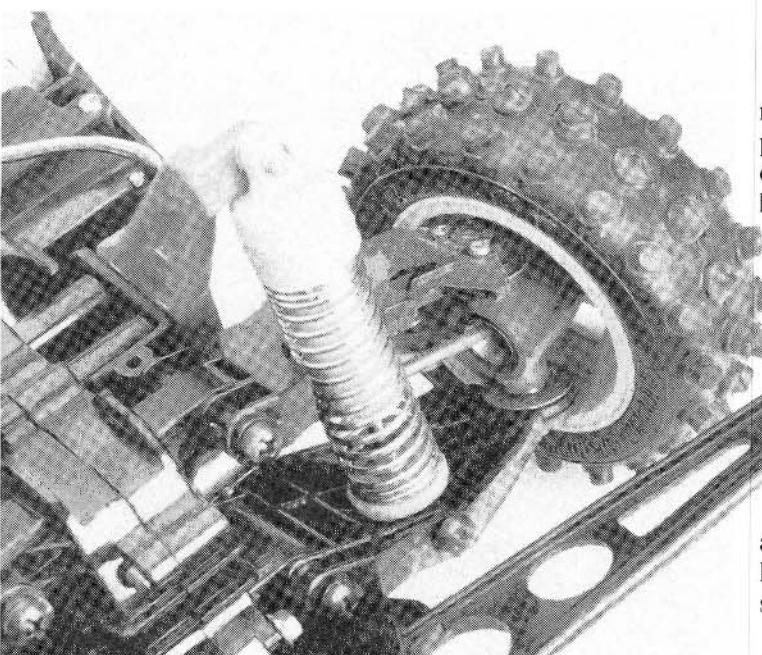
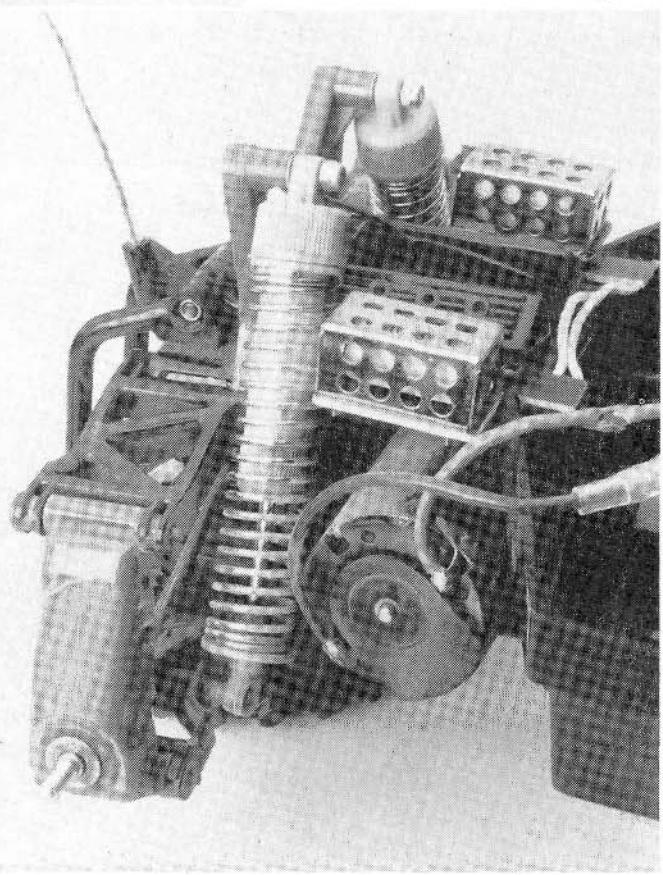
The pinion part of the Firefox's rack-and-pinion steering is attached to the steering servo. The tie rods are



set at the factory and provide the proper toe-in; just put the servo into place and secure it. Install the speed controller and its servo. This step is easy and almost foolproof, because if you've already centered the servo, the controller plate can be attached directly to the servo, and it only goes one way—no guesswork!

Finally, put the receiver into the chassis (hold it with double-sided servo tape), put the receiver switch into place, and that's it!

The Firefox is designed to be used with a BEC-equipped



There are upper and lower arms at all four corners; the front shock towers flex slightly. The large front bumper gives good protection.

Left: At both ends, the molded-ABS tub chassis holds a differential; they're joined by a central drive shaft.

Below: The resistor boxes are out of the way and exposed to the air for cooling. The shocks are oil-filled, and the axles all run in bronze bushings.

radio system, and the BEC plug is built into the speed controller. The chassis doesn't have enough space for a separate 4.8V, dry-cell radio pack.

The instruction manual might seem confusing at first, but don't panic—it's written in four languages. You'll only need to refer to two pages—and hope that one of the four languages is the one you speak!

After installing the radio, attach the colored, ABS-plastic body to the chassis

with four screws, add your choice of the supplied decals, and it's time to race!

PERFORMANCE

Before putting the Firefox to the test, run an off-the-ground check of all the systems to ensure that the speed controller and steering work properly. Mine were right on the mark and didn't need adjusting.

With the Firefox on the ground, I gradually applied power, and it accelerated smoothly, going through the three speeds as it should. I easily negotiated the first left

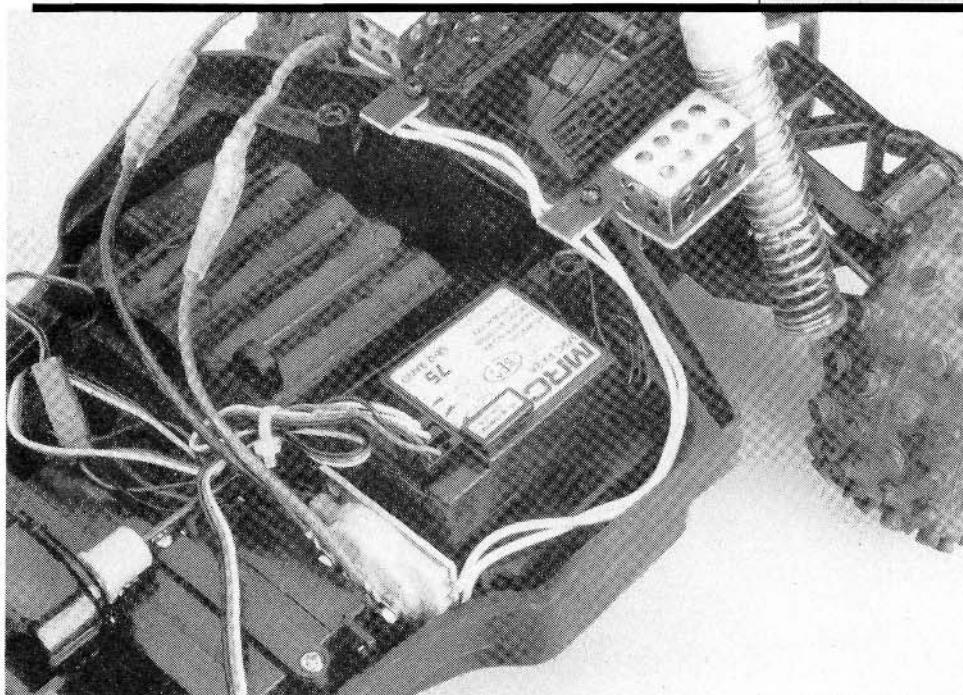


turn at full throttle. Next, a short straightaway and another left turn—again at full throttle. After a quick right, I reduced the throttle to about half, but went quickly to full throttle for another short straightaway followed by a long sweeping left and a long straight with a set of staggered moguls.

The Firefox seemed very unstable as it bumped its way

former. It ran the fully charged pack to a standstill with average top speeds, but its overall handling was poor.

The real test came when a few trackside novice R/C fans ran the Firefox. As expected, the youngsters put it into the wall several times and overturned it, too. A complete inspection showed it was little the worse for wear (just a few scratches), and all systems still



Radio installation is tight and leaves no room for a separate, 4.8V, dry-cell pack, but BEC is provided on the speed controller. The electronics are fairly well protected from dirt.

through a hard left and then another fast right to a large jump that it didn't clear, but landed off nose-down. Run time seemed to be a little over 10 minutes, but I wasn't timing it.

As a seasoned racer, my initial impression of the car was that Robbe hasn't invested much time in making it a respectable performer. The components are there (they're essentially the same as those in the Tamiya 4WD Big Wig kit), but they don't combine to make the car a good per-

worked.

The Firefox will disappoint experienced racers, but it wasn't designed for them. The novice test drivers definitely had fun. Even though its speed and handling are somewhat below average, the Firefox makes the ready-to-run R/C car a viable hobby item. Its design is solid, and it's very affordable.

*Here's the address of the company featured in this article:
Robbe Model Sport, 180 Township Line Rd., Belle Mead, NJ 08502. ■

ROBBE

FIREFOX

Type 4WD off-road buggy
Scale 1/10
Suggested Retail Price \$89.95

DIMENSIONS:

Overall Length 15.75 inches
Width 9.5 inches
Wheelbase 10.4 inches
Front Track 8.5 inches
Rear Track 8 inches

WEIGHT:

Gross (w/battery) 4 pounds, 4 ounces

BODY:

Type Buggy
Material Plastic

CHASSIS:

Type Bathtub
Material Plastic

DRIVE TRAIN:

Primary Pinion/spur
Transmission Gear
Differential(s) Planetary gear
Bearings/Bushings Ollite bushings

SUSPENSION:

Type (f/r) Double wishbone
Damping (f/r) Oil-filled, coil-over shocks

WHEELS:

Front: Type One-piece plastic
Dimensions (DxW) 2x1 inches
Rear: Type One-piece plastic
Dimensions (DxW) 2x1.4 inches

TIRES:

Front/Rear Large stud

ELECTRICS:

Motor 540 Mabuchi
Battery 6-cell racing pack*
Speed Controller 3-speed, closed plate

OPTIONS AS TESTED:

MRC Top Gun 2-channel radio system

COMMENTS:

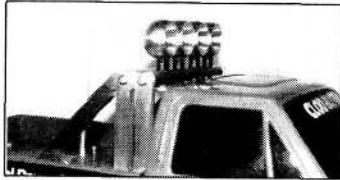
The entry-level Firefox lacks the speed and handling to excite more experienced drivers, and the absence of readily available high-performance parts restricts its potential. It comes assembled, it's fairly durable, and its suggested retail price is attractive to those on a budget.

*not included

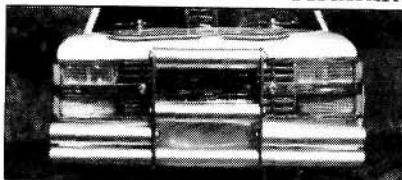
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THUNDERDROME

(Continued from page 126)

Before long, the pair had stretched out a commanding half-lap lead, but Moller couldn't manage to put any distance be-

tween his car and Boylan's. The two remained within an arm's reach of each other right through to the 3-minute mark while dodging lapped traffic. Then, with 45 seconds to go, Boylan made a final attempt to sneak past Moller, and this

turned out to be successful, as he stretched out his lead and headed for the win.

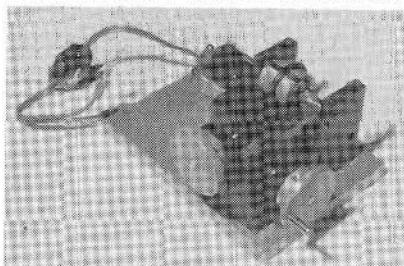
Boylan took top honors with his Twister-powered scratch-built car, with Moller 2 seconds behind with his C&M

(Continued on page 146)

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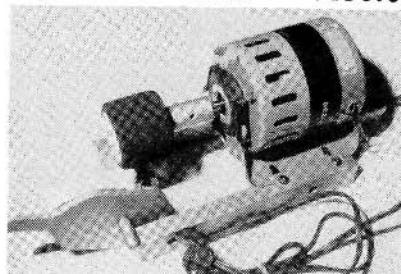
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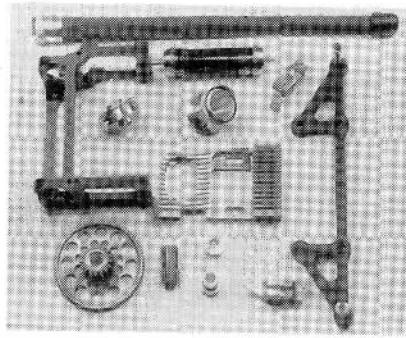


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MARU

BIG BEAR

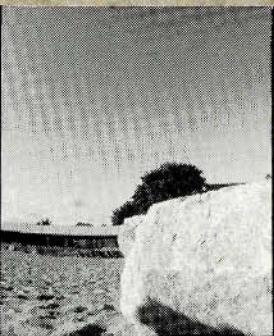
to deserve this. Were you overlooked because of a poor track record or because you hadn't yet had a chance to prove yourself?

We recently had an overlooked player on our sidelines at the editorial office of Car Action. After seeing it sitting on the bench for several weeks, I wondered why the Marui Big Bear hadn't been assigned to anyone for review. I guessed it wasn't high-tech enough to warrant the immediate attention of our editors; or perhaps it wasn't being given a real chance.*



KODAK 506

21



KODAK 5062 PX

20



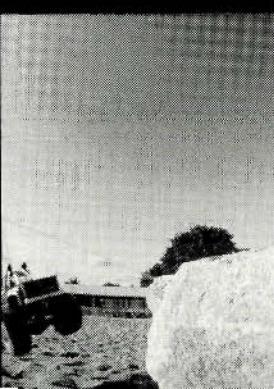
KODAK 5062 PX

19



KODAK 5062 PX

18



SPECIFICATIONS

Type Sport truck
 Scale 1/12
 Sug. Retail Price \$119.99

DIMENSIONS:
 Overall Length 16.25 inches
 Width 11 inches
 Wheelbase 8.75 inches
 Front Track 8 inches
 Rear Track 8.5 inches

WEIGHT:
 Gross (w/bat.) 5 lbs, 3.45 ozs

BODY:
 Type Datsun pickup
 Material Polystyrene resin

CHASSIS:
 Type Tub
 Material Polystyrene resin

DRIVE TRAIN:
 Primary Pinion/spur
 Transmission Gear drive
 Differential(s) Bevel gear
 Bearings/Bushings Bushings

SUSPENSION:
 Front: Type Trailing arm
 Damping None
 Rear: Type Trailing arm
 Damping None

WHEELS:
 Front: Type Three-piece plastic
 Dimensions (DxW) 2x3
 inches
 Rear: Type Three-piece plastic
 Dimensions (DxW) 2x3
 inches

TIRES:
 Front Vee-pattern
 Rear Vee-pattern

ELECTRICS:
 Motor Stock 540
 Battery 6-cell flat pack
 Speed Controller Mechanical

OPTIONS AS TESTED:
 Totally stock; Trinity 6-cell Sanyo SCRs;
 Acoms Techniplus radio.

COMMENTS:
 For a box-stock vehicle, the Big Bear ran well for the photo shoot. Replace the speed-controller battery connectors with the more popular Tamiya ones. The ball links on the steering setup are inadequate and, after a while, will have to be replaced.

"Let me review the Big Bear," I said to Steve Pond, not knowing any reason why this neat-looking monster truck wouldn't be a blast to run. "No problem, my son," he replied as he handed me the kit box. I thanked Steve and headed to my R/C car building garage. I was going to have fun and prove this R/C rookie could make the cut at the same time!

look durable.

Relatively speaking, the Big Bear kit contains a modest number of parts and a straightforward manual. This is helpful, especially if you're really after a quick construction so that you can get outside and hit

the dirt! If this is your first kit, however, take your time, build it slowly, and plan to spend approximately three nights on assembling and painting.

BEAR BUILDING

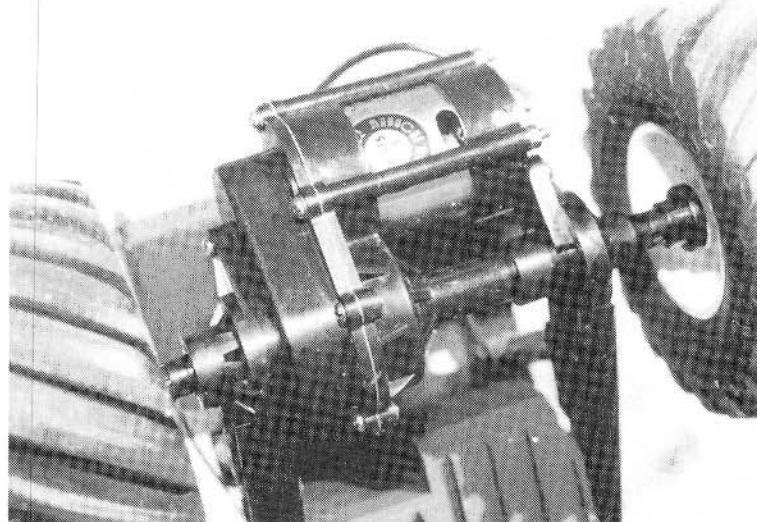
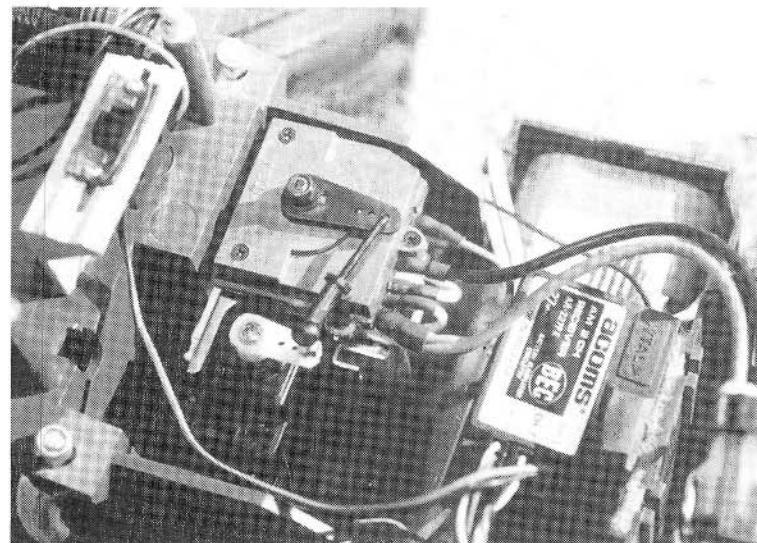
The manual is easy to fol-

"I classify the Big Bear as an entry-level, production-class, 2W, rear-drive, monster truck."

THE BOXED BEAR

Since my last review of the Raider ARR (December, 1989), I've learned a little more about R/C cars and trucks, and I classify the Big Bear as an entry-level, production-class, 2W, rear-drive, monster truck. Right away, I noticed its fully enclosed manual speed controller (it's supposed to be more reliable than an exposed one), and I looked forward to trying it out.

Four, independent, spring shock towers raise the chassis above the large, oversize tire and wheel assemblies. There are no time-consuming shock assemblies to build, or messy oils to deal with. The deep, hard-plastic chassis has a centered, well-protected battery-pack recess (for 6-cell packs only), and all the parts



■ Top: step speed controller worked well, but I'd like to see the resistors outside the chassis instead of below the controller with the servo.

■ Bottom: externally, the differential is identical to the original, but the beveled gears have been beefed-up. The unique motor housing offers protection.

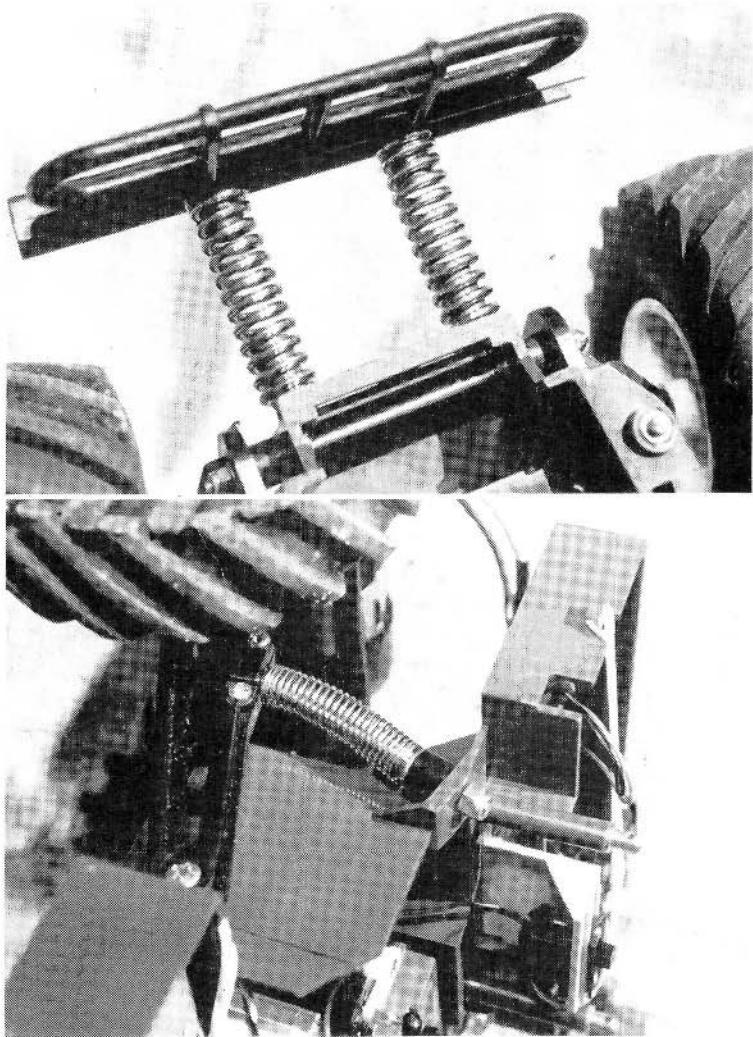
BIG BEAR

low, but you could get hung up if you rush or skip a step. Here are a few tips to help you complete the assembly without problems.

First, familiarize yourself with all the parts and read through the manual. Before starting on a section, check which hardware you'll need and gather it. A lot of the nuts and bolts look alike and will fit in several places, but if you aren't careful, you may eventually need a part that you've

already used, and you may have to disassemble the kit to find it!

The gearbox assembly contains bevel bushings and bushing pins. Be sure the bushing-pin ends don't protrude through the bushings; if they do, the gearbox pieces won't fit together correctly, and the gear case won't close properly. The motor-cover fit is tight, but don't force it: bring the two sides together with a twisting motion.



■ Top: spring-loaded front bumper looks unusual, but does provide protection—also lowers insurance rates! ■ Bottom: trailing ladder-arms are durable and supply more travel than the front trailing cam-arms, but no damping.

A little extra time spent on the details can save you a lot of time later!

Any flaws in the Big Bear kit?—yes: its tire inserts, which were impossible to assemble. I even followed the "Pit Tip" suggestion submitted to *Car Action* by Curtis Forester of West Bend, WI, but I eventually decided to do without them (with no adverse effect). Be sure to glue your tires to the rims with a little CA around the inner and outer edges. *Don't* glue the headlights to the roll bars; you don't want them to snap off when the truck rolls.

With the gear case assembled, test your motor with a 1.5 to 3V battery. My major goof was that I failed to tighten the pinion gear properly, and I had to disassemble the gear case completely after I had mounted it on the body! Watch out! A little extra time spent on the details can save you a lot of time later!

For this review, I chose a two-stick radio by Acoms*—the Techniplus AP-27MKV. Servo installation was easy, and all the necessary hardware was included. Unfortunately, the receiver wires weren't long enough to allow me to mount the receiver on top of the steering servo (as specified in the manual). I mounted it mid-chassis (using Velcro®), because it must be removed each time I change the battery pack), but this position isn't unreasonable, and it puts the receiver in a fairly secure position.

I didn't set the system up for BEC (battery-eliminator circuitry), because I wanted to review the Bear in a condition that was as close to stock as possible. Besides, the extra

battery weight wasn't a consideration, and I like the security of knowing that it won't run out of range easily when the motor-pack voltage runs low.

For power, I selected Trinity* SCRs, which are great performers. If you're interested in a versatile, practical pack that can be used several times on one day without harming the cells, these are for you. I also recommend them for first-time drivers.

THE BEAR'S TOO BARE!

It was time for painting and finishing. The Big Bear comes with a solid-white body that must be painted on the outside, because it isn't Lexan. To produce a two-tone effect, I used Pactra* spray paints and masking tape. I masked off the blue areas with tape, and then I painted the hood stripes and bed because they're in the lighter color. I waited for the paint to dry, masked off the silver areas and then painted the rest of the truck blue. When I removed the masking tape, some of the paint lifted off, so I touched-up the exposed areas by spraying a puddle of paint onto a plastic baggie and then using a brush to apply several coats.

The Big Bear's driver comes in several pieces that you must assemble and paint. I recommend that you spend some time detailing and personalizing him before sitting him inside the truck. This personal touch will set your truck apart from others, and your peers will immediately recognize

(Continued on page 232)

THUNDERDROME

(Continued from page 134)

Cobra car with Cobra motor power. A charging Hamilton rounded out the top three, but he could only narrow the gap to 6 seconds for the 3rd spot.

At the end of the Modified A-Main, the hand trucks headed out to the infield with stores of batteries, chargers and spare parts for the A-Main Superspeedway showdown.

The event would be won by the first driver to cross the line with 140 laps around the mammoth Thunderdrome. This translates into a distance of just over 25 miles—just under 1 mile short of a marathon!

Sitting in the top spot was Kent Clausen, the “winningest” driver at the Thunderdrome. Just behind Clausen was Cliff Lett, who, in his first running of the Thunderdrome, managed to qualify better than most of the veterans. In the 3rd spot was Ralph Burch Jr., last year’s winner, with his CAM-powered Hyper 10. Bud Bartos, who has also been a strong runner during previous events took the 4th spot.

In the middle of the field at the number

5 spot was Bob Novak driving a Reedy-powered 10L that’s identical to those run by Lett and Clausen. The Wimpy-powered McAllister MX Pro driven by Dave Pulfer took the 6th spot; the number 7 starting position went to Ken Moon and his B&R-powered 10L, while Phil Simms took the 8th spot with his CAM-powered Bolink LTO Enduro. The 9th spot went to Rick Jordan with a CAM-powered Bolink Enduro, and—sneaking into the final spot in his last round of qualifying—Don Rice of Futaba drove a Fantom-powered Bolink Enduro.

Jumping out to an early lead, Hyperdrive’s Ralph Burch was followed by Bud Bartos. Burch held on to his lead right through the second pit stop, but about halfway through his third battery, he suffered a monster radio hit that sent his Hyper 10 blazing into the high wall on turn 3 at 60mph. This sent him back to pit row for some lengthy repairs.

An accident on the first lap tied up Cliff Lett in the back of the field, but he was soon back in the hunt, as he followed Clausen past Bartos for the 2nd-place spot. Bartos, who was still running strongly and was a “definite,” developed a tire problem that forced him into the pit

for a lengthy tire change and put him well back into the field.

Bob Novak also had an unfortunate crash with Ken Moon as Moon was on his way out of pit road. Novak’s left front tire was sheared right off his car, but he decided to make the best of it and continued to run the race—and at competitive speeds, I might add! This earned him the title of “Tripod Bob” for the rest of the race! Ken Moon suffered the worst of the crash: he was able to continue, but the impact knocked his car too far out of adjustment to run with the pack. Tire problems plagued Bud Bartos and Dave Pulfer, forcing them into the pits long enough to take them out of contention. Rick Jordan of Bolink suffered some mechanical trouble that kept him off the race pace.

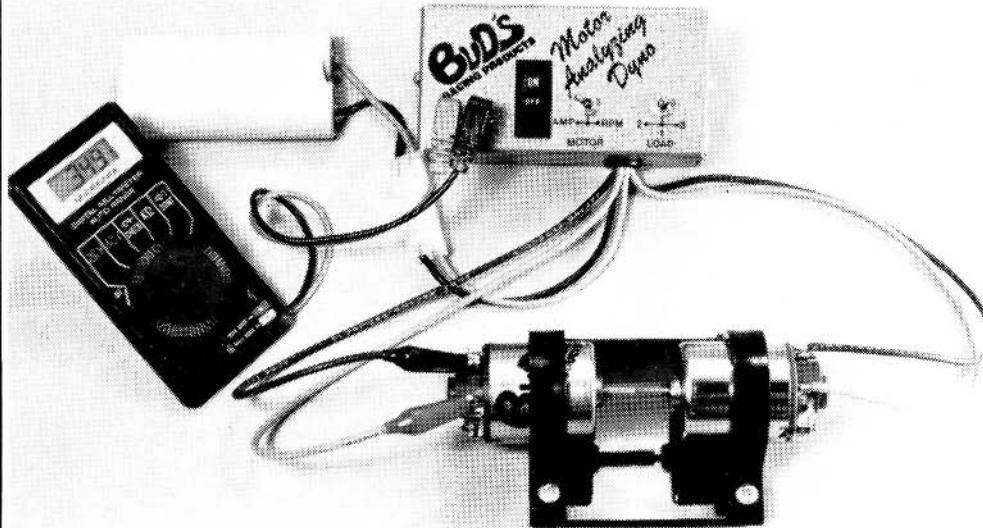
So who was left? Phil Simms had a spectacular run going, and this kept him in the front of the pack, but that still left Kent Clausen in the lead. During the last 20 laps, it seemed as though Clausen’s motor was starting to feel the effects of the high heat as his lap times were falling off. Clausen’s time didn’t drop off too much, but it was enough to allow Simms

(Continued on page 158)

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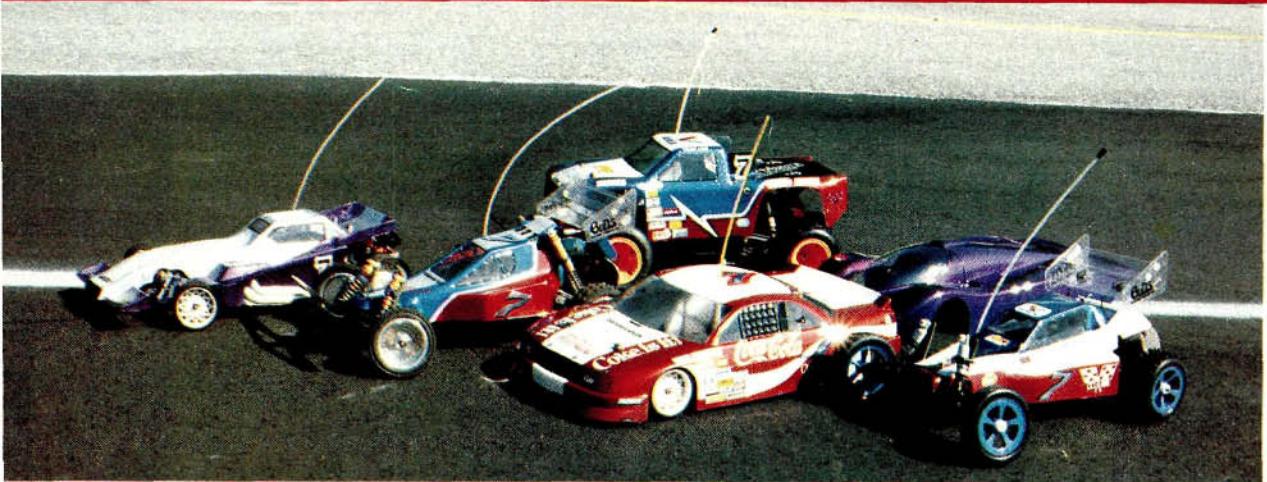
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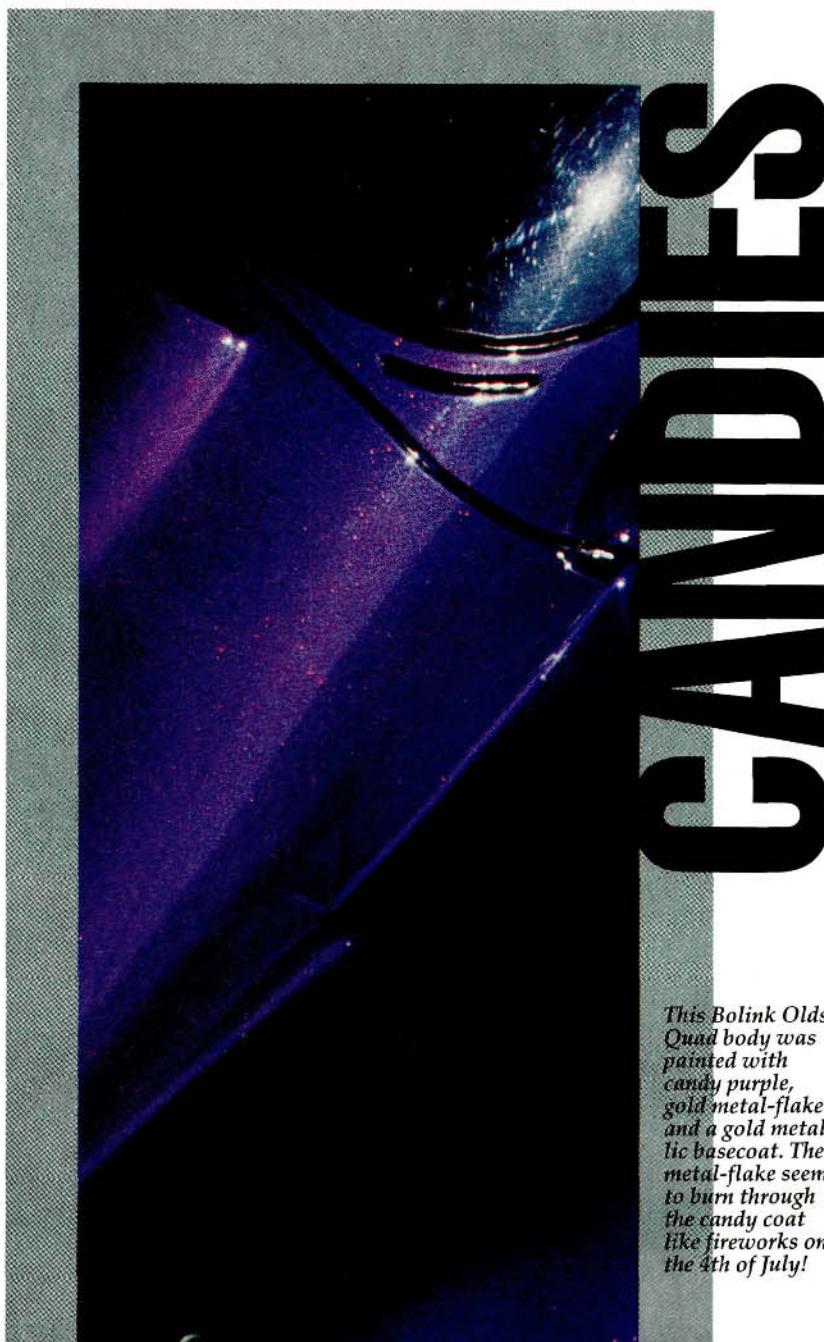
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PHOTOS BY BOB GAGNE

Make your winner shimmer

by BOB GAGNE



This Bolink Olds Quad body was painted with candy purple, gold metal-flake and a gold metallic basecoat. The metal-flake seems to burn through the candy coat like fireworks on the 4th of July!

DO YOU HAVE a great design to paint on your R/C racer, but you're bored with the plain colors and the few metallics available? Pactra* and Hyperion* have come to your rescue with silver and gold metal-flake paints and custom candy colors—including shades of red, blue and purple—that will appeal to the artist in every modeler.

Want to "jazz up" these prod-

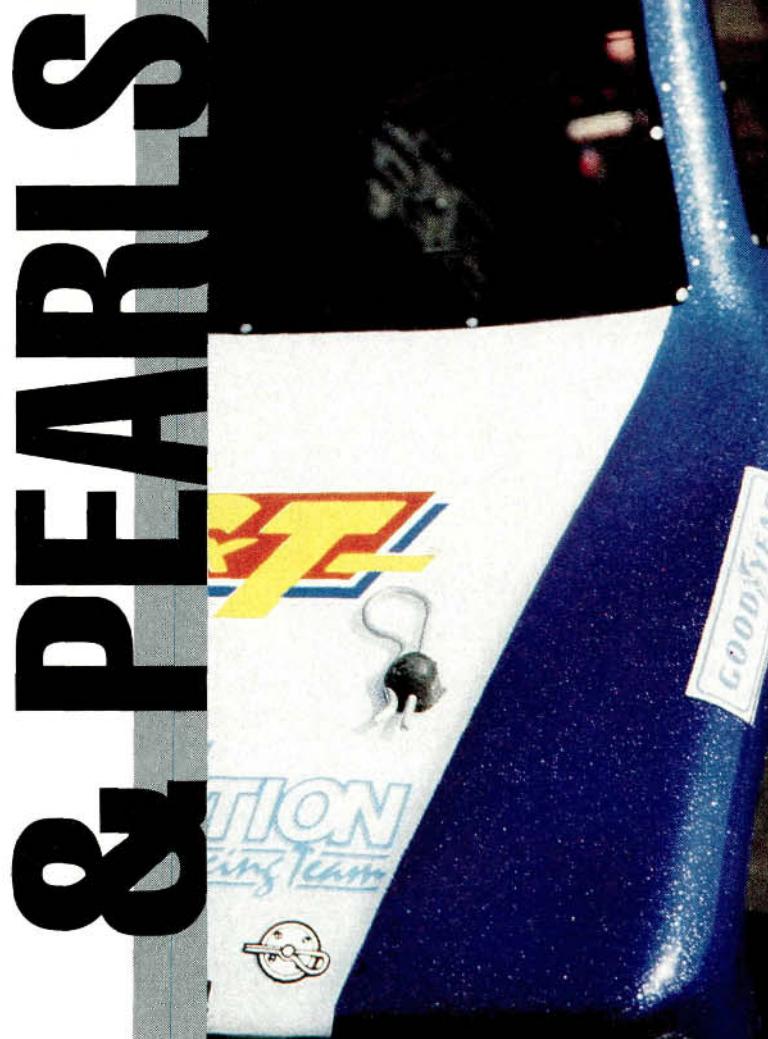


ucts?—try using them with the pearlized colors: copper, coral, purple and clear. (Some have been available for a while; others are new to the Pactra line.) You can combine these paints to create interesting effects that were very difficult—or practically impossible!—to achieve before.

BACK IN THE DULL AGES

Candy colors were once very difficult to obtain. To get the right consistency, you had to thin a regular paint, and this made it difficult to apply. Runs were a problem if you used an airbrush, and it was impossible to apply an even coat with a paintbrush. Good results depended

On the front fenders, candy purple fades into candy blue. This photo shows the dramatic effect you get when you apply metal-flake coats first.



FLAKES



Close-up of an Andy's Lumina body painted in candy-red metal flake and white with silver metal-flake. The candy red was applied first, followed by silver metal-flake, which was then backed with silver metallic. The white part of the hood was sprayed with silver metal-flake—a heavy coat at the nose and a light coat near the windshield—and then backed with white.

more on luck than skill!

You could only produce a metal-flake finish by buying custom automotive finishes and using a flex additive. A single 1/10-scale-car paint job could cost almost as much as the car kit, and the paint was so delicate that it often chipped off after the first flexing of the body! Like the "home-brew" candy colors, metal-flake was impossible to apply without an airbrush. In short, it wasn't worth the effort!

CANDIES, FLAKES & PEARLS

Pactra and Hyperion RC Racing Products have made it easy and inexpensive for anyone to get the "custom look"—even without an airbrush! Their candy colors and metal-flake paints come in bottles and aerosol cans. You can use the following techniques with either method, and the results will be about the same.

THIS ISN'T MAACO!

The order of paint application for a Lexan (polycarbonate) body is the opposite of that for an automobile body. On an auto body, the base color (usually an opaque white) is applied over a primer-filler and covered with a metallic or metal-flake paint (e.g., silver or gold), which is then covered with a translucent candy color. Finally, to seal and protect the delicate candy color, a clear topcoat is applied.

On a Lexan body, the protective clear coat is the body itself. First, you apply the translucent candy color, then the metal-flake or metallic paint, and finally the opaque base color. The translucent candy color is the most important step, so experiment on the sections you've trimmed off the body.

The lighter and fewer the coats, the stronger the metallic (candy) or metal-flake effect will be. The heavier or more numerous the coats, the weaker it will be. Start with the thinnest coats of translucent color that you can apply evenly, and work up to the desired density. You can always put on more coats if the paint is too thin, but you can't take coats off!



Although using an airbrush like the Paasche (left) or the Badger (right) is the best way to finish any model, Pactra's candy colors also come in aerosol cans, as do some metal-flake paints. Hyperion RC Products makes Show Flake in three colors.

Try to overlap your pattern in exactly the same way with every pass of the airbrush or aerosol can. If you're not careful, you'll end up with a mottled paint job that has streaks and spots.

Once you've achieved a color density you like, spray on the metallic or metal-flake coat. Make sure that the candy-color paint is completely dry first; if it isn't, the metal-flake might bleed through and leave specks of metal flakes instead of a nice, even background.

If you're applying a plain candy color, you don't have to use an opaque final coat, because silver and gold metallic paints are opaque. Metal-flake paint jobs need the base coat, however, or the paint will remain translucent. White is the most common base coat, but you can use silver or gold metallic with metal-flake for a candy-color look as well as the metal-flake effect.

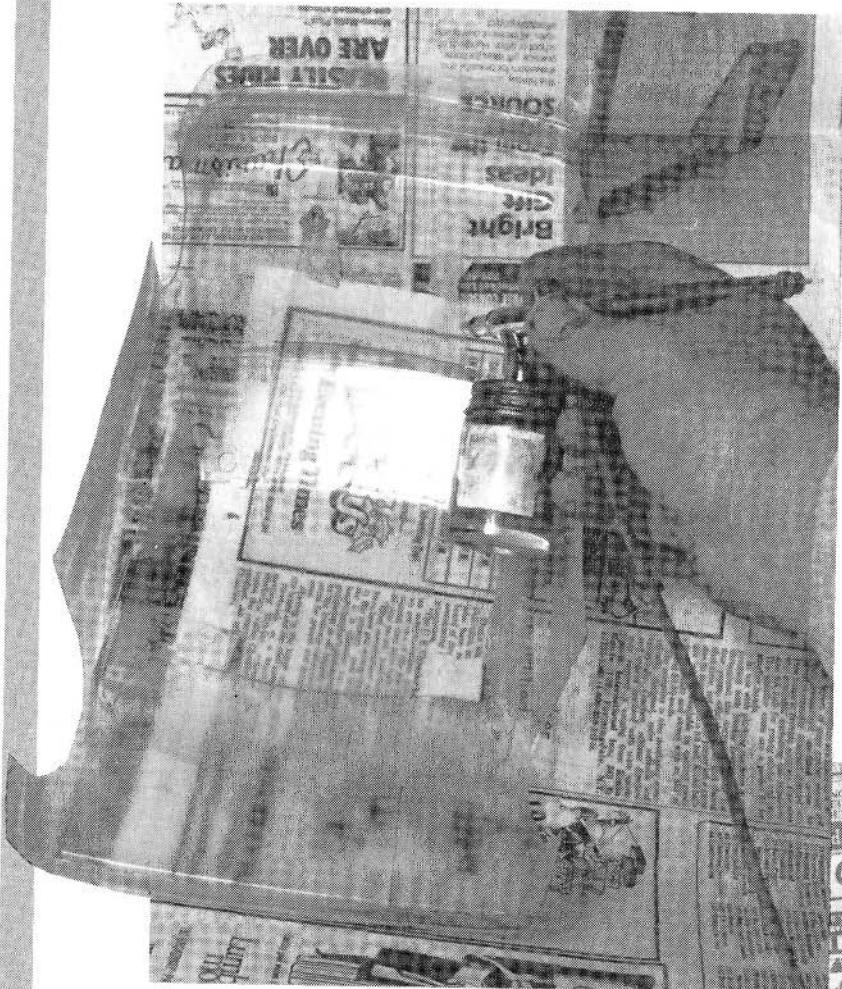
Metal-flake is fun to work with, and you can experiment with heavy or light coats to get

just the right effect. To vary the finished product, you can try all sorts of combinations! A silver metallic coat is usually used with the cooler candy colors (e.g., blue or purple), but you might prefer gold. Gold is usually the color chosen for warmer colors (like red), but try silver for a lighter effect. Here's a combination I like: a light coat of red candy color, followed by a medium coat of gold metal-flake and topped with silver.

FLAKE FIRST; CANDY LATER?

There are three ways to apply the metal-flake coat with candy colors:

- You can apply it when all the candy color coats have been applied. (This is the way it's usually done.)
- You can apply one coat (or a few very light coats) of candy color, then the metal-flake coat(s), and then a heavier coat of candy color. This technique will give you a more vivid metal-flake effect without over-



Above: You can apply a coat of candy color or metal-flake to the body first (as in this photo). Make sure that each coat is dry before you proceed to the next.

powering the candy color.

- You can even use a light coat of metal-flake *before* the candy color. This produces a very dramatic metal-flake effect that sparkles as the body catches the light. Don't apply the metal-flake too heavily, though, because it can overpower the candy color.

You can back any of these combinations with a coat of solid or metallic opaque color. Again, your choice will change the look of the finished paint job, so experiment first. Don't mess up a hard-to-find body that must be ready for a weekend concours!

Why not try a coat of metal-flake followed by plain red, blue, or any other color? This technique works especially well with

the pearlized paints. A light coat of silver metal-flake followed by a coat of pearlized paint will give your car's body a silvery brilliance. You can back the pearlized paints with an opaque white, or try silver to create a tone somewhere between white and silver.

There are hundreds of combinations—including blends of two candy colors—so let the "Big Daddy" Ed Roth or the Picasso in you go crazy! With a little experimentation, you'll have a show-stopping paint job that will earn you the admiration of other racers and the attention of the concours judges!

**Here are the addresses of the companies mentioned in this article:*

Pactra/Plasti-Kote Co., 1000 Lake Rd., Medina, OH 44256.

Hyperion RC Racing Products, P.O. Box 31724, Richmond, VA 23294.

Below: A white, silver, or gold coat makes an opaque finish, so you can't see through the body. Note that the paint job on the hood has been completed, but the trunk and roof have only been partially finished and are still translucent.



Scoping Out

by JOHN RIST

Aristo-Craft's Thorr SP960

HERE'S A SPEED CONTROLLER that defies description!—but I'll try anyway! The Aristo-Craft* Thorr SP960 is the biggest mixture of good and bad news that I've ever seen in one package!

It has these features:

- forward-only with brakes, racing style speed controller
- one FET for brakes; six for forward
- three adjustment pots: neutral, full speed and brakes
- transparent case
- peak current: 1440 amps
- 4- to 8-cell capacity
- user's manual and fuse

I didn't have to open the case to in-

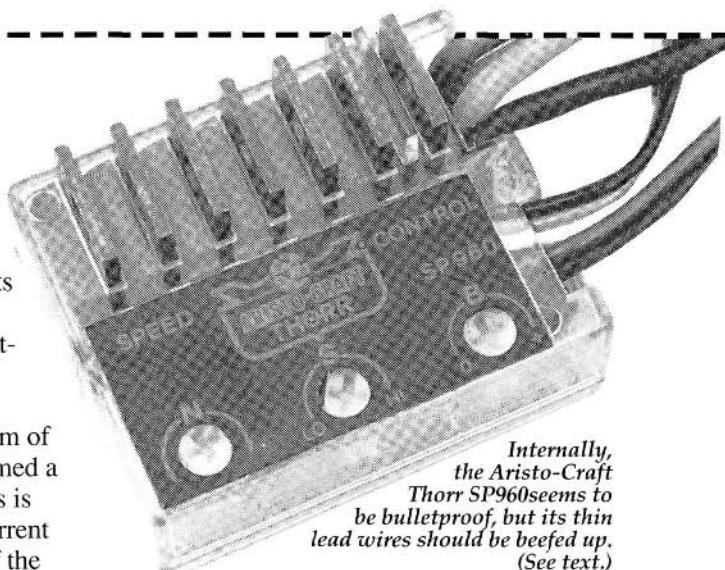
spect the SP960's innards because its case is transparent. Its construction looked first-class, but the battery and motor wires looked small.

Aristo-Craft's claim of 1440 peak amps seemed a little inflated, but this is probably the FET current rating and not that of the printed-circuit board or wiring. Was this the true FET current rating? A high current rating usually means low resistance, which, of course, means high performance, so I was eager to test this SC in the "Scoping Out" lab.

LAB TESTS

After reading the instruction sheet, I always get an SC to work on my test bench before trying it in a car. The first step was the installation of a fuse, because, unlike more expensive units, this SC has no electronic thermal protection circuit. A fuse provides good protection against burnout, but it also reduces performance.

Next, I found a problem in the wiring diagram. Two controllers were shown: a four-wire version (two each for battery and motor)—model no. SP959; and a three-wire version—the SP960. The SC I was holding clearly had "SP960" marked on it, but it also had four wires sticking out of its case! (red and black for the battery, and red and blue for the motor). The only stated difference between the two models is in the wiring; their peak current and voltage-operating range were supposedly the same. It seems that Aristo-Craft planned to use a three-monster-wire setup in the SP960 and the usual



Internally, the Aristo-Craft Thorr SP960 seems to be bulletproof, but its thin lead wires should be beefed up. (See text.)

four wires in the SP959, but somewhere in the cost-cutting loop, the monster wire disappeared.

The good news is that Aristo-Craft didn't waste money on connectors. This is supposed to be an all-out racing speed controller and, as such, it deserves high-grade connectors like Sermos* Power Poles. Following the wiring diagram, I settled the hook-up issues, and it was time to set the pots to match my Pit Stop radio servo tester and pour on the juice.

At this point, I had a second surprise: the SP960 has neither a built-in nor an external pulse checker. The instructions tell you how to use a digital voltmeter to set full speed, and although I thought this a weird way to set full speed, it works (as long as you have a digital voltmeter).

The final item in the set-up instructions was a warning that you should use a heat sink if the controller is to handle more than 10 amps (all race cars pull more than 10 amps!). Unfortunately, Aristo-Craft didn't include a heat-sink set, nor did it recommend a brand that would fit. I discovered that the Tekin* and Novak* heat sinks would work with the SP960, but at that point, I wasn't worried about installing one, because I always test an

THE "SCOPING OUT" LAB

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30-amp electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5-watt power resistors, which can be switched on and off one at a time to vary the load between .6 amps and 20 amps.

In series with the resistors is a 25-amp Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

CHRISTMAS TOP-100



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SC by running it "naked" to see whether it has the guts to survive.

With the controller connected and the full speed set, it was time to take some voltage readings. I always take two readings on the wires:

- first, from end to end (including the fuse)
- second, at the 2-inch point along the wires

The first reading establishes the SC's stock performance level; the second reading shows the power-robbing effect of long wires, fuses and connectors, and it also provides a standard for comparing SCs.

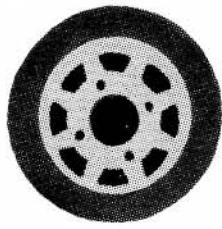
I pumped 12 amps through the SP960, and the first reading showed a voltage drop of 0.19 volt—a resistance of 0.015 ohm. With 12 amps still flowing, the second reading was an amazing 0.06 volt—a very low resistance of 0.005 ohm. If you've been reading this column for a while, you'll know that a resistance level this low is usually found only in the top-of-the-line, high-buck seven-FET SCs. It's interesting that the setup with long, thin wires and a fuse performed 3.2 times worse than the one with 2-inch wire.

Next came my "let-it-cook" test: I passed a hefty 18 amps through the controller for 15 minutes (without the benefit of cooling air or heat sinks). After this, the SP960 was warm (not hot) and so were its battery and motor leads. Given the small power leads and super FETs, this is what I expected. The FETs were doing a good job, but the battery and motor leads were "sad."

My final test is the "dead-short" test, and it's designed to discover whether the controller would survive if the motor jams or burns out. Using a shorting device made with monster wire and two alligator clips, I shorted directly across the motor output leads. The current-meter reading jumped to 42 amps, and the wiring became quite warm. I

(Continued on page 156)

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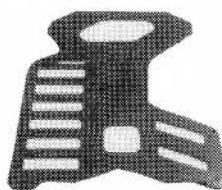
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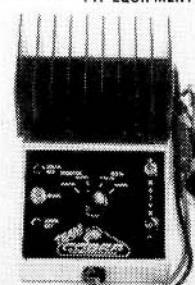


PIT EQUIPMENT STOCKING STUFFERS

VR3000

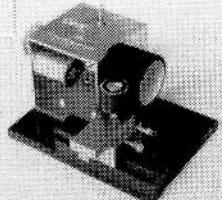
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SCOPING OUT

left the wire in place for 30 seconds, and the 30-amp fuse didn't blow. You can overload fuses quite a lot before they burn out, and this 30-amp model was still hanging in at 42 amps.

ARISTO-CRAFT THORR SP690

DIMENSIONS:

Height (w/heat sink)	0.75 inch
Width	1.5 inches
Length	1.19 inches
Weight	1.4 ounces

TUNING:

Access to Controls	Good
Ease of Adjustment	Fair

PRICE:

Suggested Retail	\$89.99
Warranty	180 days

ELECTRICAL:

(Manufacturer's Specs)

Max Voltage	9.6 volts
Min Voltage	4.3 volts
Max Current Forward	1440 amps
Continuous Current Forward	not listed
Resistance	not listed

TEST PARAMETERS:

Voltage	6 volts
Current	12 amps

TEST RESULTS:

Voltage drop to end of wires	0.19 volt
Voltage drop at 2-inch point	0.06 volt
BEC output, 6-cell battery	6.0 volts
Resistance to end of wires	*0.015 ohm
Resistance at 2-inch point	*0.005 ohm
*Resistance=Voltage Drop/Amps	

COMMENTS:

The Aristo-Craft SP690 has many shortcomings: it has no pulse checker (you set full speed with a digital voltmeter); the pots are misaligned (this makes it difficult to adjust, but Aristo-Craft suggests you use a fuse); and—worst of all—it has the smallest wire that I've ever seen on a racing speedcontroller. Nevertheless, this controller has a world-class low resistance that makes it a cool-running hot performer. High performance, smallness and low cost make the SP690 an excellent buy.

I removed the short and replaced the lab's power supply with power from a 7-cell Ni-Cd pack. Ni-Cd packs can deliver as much as 100 amps into a dead short, and when I put the killer wire back into place, the fuse popped like a piece of popcorn. The FETs were hot, but nowhere near "melt-the-case" hot.

To see whether the SC had survived, I reapplied power—it had! Few controllers are completely burnout-proof, but the high-grade, low-resistance FETs in the SP960 are strong enough to take a lot of punishment. Remember, I didn't use a heat sink; if you use one, the SP960 should be even tougher. If you run the fuse, the setup is almost indestructible.

CAR TESTS

It was time to have some fun! I mounted the SP960 in my newly acquired Bolink Eliminator pan car using Sermos Power Pole connectors on the battery leads to match the leads on my packs.

Then I decided to try a Corally connector, which I discovered while doing research for the "Connector Inspector" article that appears elsewhere in this issue. I had learned that the Corally connectors weren't suitable as battery connectors because they can't be polarized to prevent you from installing the battery backwards. It should, however, be possible to solder the barrel-shaped female half of the connector directly to the motor brush hoods and the male half to the SC's motor leads. This did, in fact, prove to be possible, and the Corally connectors worked well as motor connectors.

With the car set up and several charged battery packs, I headed to the parking lot. This setup was fast! In no time at all, I had a dozen people watching my bright-orange T'bird cut a trail. I had deliberately geared the car fairly high to take advantage of the large parking lot and to push the SP960 a little to see if it got hot. The battery lasted about 5 minutes, which was about right for the high gearing.

I brought the car in while the battery had a little juice left (I hate walking after a car!). The battery was hot, the

motor was hot, but the SP960 was only slightly warm. I took a short break to let the motor cool, installed a second battery and put in a second blazing run, during which I played with the brake-control pot. I found that the brakes could be dialed all the way out at one extreme end, and set to normal at the other. This could be good on a fast roadcourse or oval where having lighter-than-normal brakes works well. Moreover, heavy braking is seldom needed, even on tight roadcourses.

On this run, I pushed the car till the battery ran all the way down. The BEC held up well to the end, and there were no glitching or runaway tendencies until the battery was so depleted that the car had slowed to a crawl.

GOOD NEWS & BAD NEWS

With this controller, you have to be prepared to take the rough with the smooth. The bad news? The instruction-sheet wiring diagram didn't agree with the SC's model number. (It had the correct diagram, but it was listed as an SP959.) The absence of a pulse checker was very inconvenient. The voltmeter method of setting "full-on" worked, but it took a lot of fiddling to make sure I had a solid full-on at the 80-percent trigger setting. The saddest parts of the setup were the battery and motor wires, which are totally inadequate for a controller of this size. I don't understand how a manufacturer can spend big bucks on premium FETs and then choke them to death with chintzy wire.

The good news? This controller is a *real performer!* Its resistance measurements put it in the "serious" racing class, and it's small and light, so it can be installed in most 1/10- or 1/12-scale cars or trucks. Where it counts, i.e., low resistance and cool operation, this controller scores high. The SP960 carries a generous 180-day warranty, but Aristo-Craft lists a flock of "no-no's" (ranging from reversing the battery to altering the wires), any one of which would void it. This, coupled with a \$15 charge on any warranty repair, makes the warranty a little "thin."

This controller has a lot of potential

(Continued on page 232)

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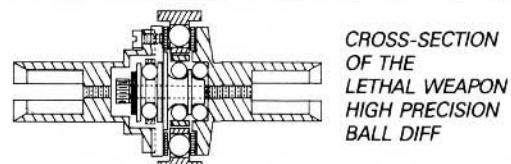
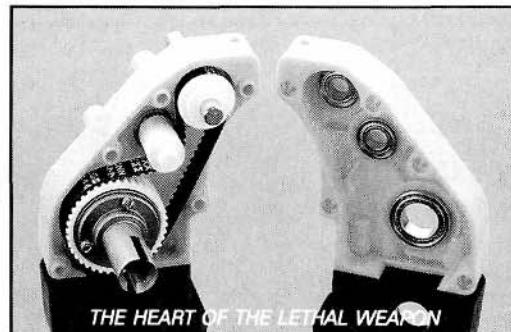


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THE HEART OF THE LETHAL WEAPON

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BALL DIFF

THUNDERDROME

(Continued from page 146)

to make up a few laps and begin to threaten him. Clausen's motor was able to hold on, and he skated across the finish

line as the first to make the 140-lap mark (with Simms only a lap behind) to take the honors as the 1990 Thunderdrome Superspeedway champion.

This brought to a conclusion the 1990 R/C Thunderdrome. Despite the intensity

of the competition and the raging heat, all the competitors managed to keep their cool and have a good time. A great deal of credit for the success of the event has to go to Dan Moynihan and Gary McAl-

(Continued on page 166)



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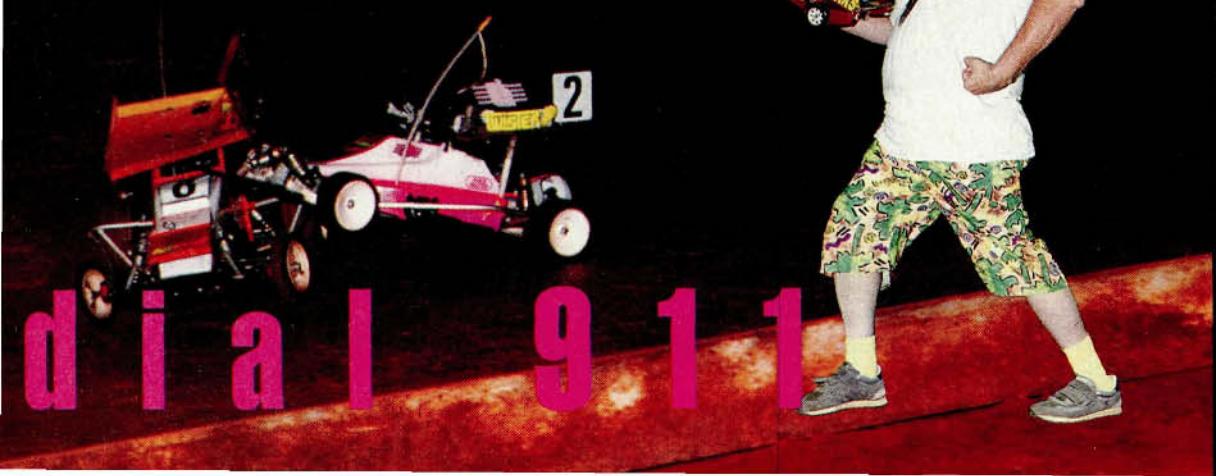


by JOHN HUBER

FOR THE 1990 NORRCA Dirt-Oval Nationals, the nation's top drivers converged on Cooper's R/C

Center in Chatham, VA—a remote area of farmland in the foothills of the Appalachians. Although this was the first race of this magnitude held at Cooper's, they had no problems handling the job.

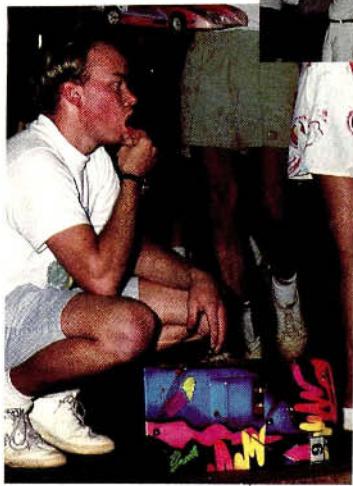
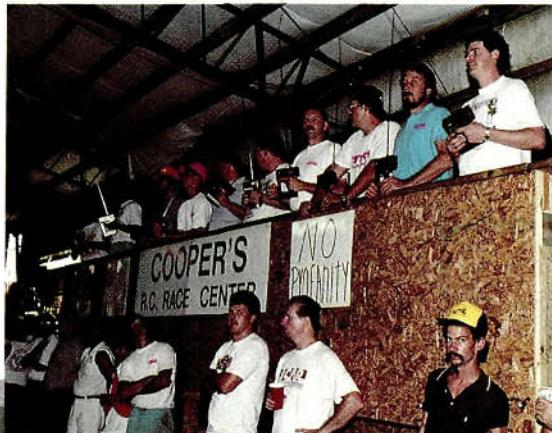
The facility has a totally enclosed clay oval with ample pit space and AC power for up to 300 racers. At the back is a new asphalt oval track, which should be great when it's completed. To top it all off, there's a well-stocked hobby shop (for those unscheduled repairs!) and a snack bar with everything from chili dogs to ice cream! I had never been to a National



dial 911

DIRT-OVAL

DIRT-OVAL NATIONALS



event—let alone a dirt-oval race!—and was looking forward to some serious action.

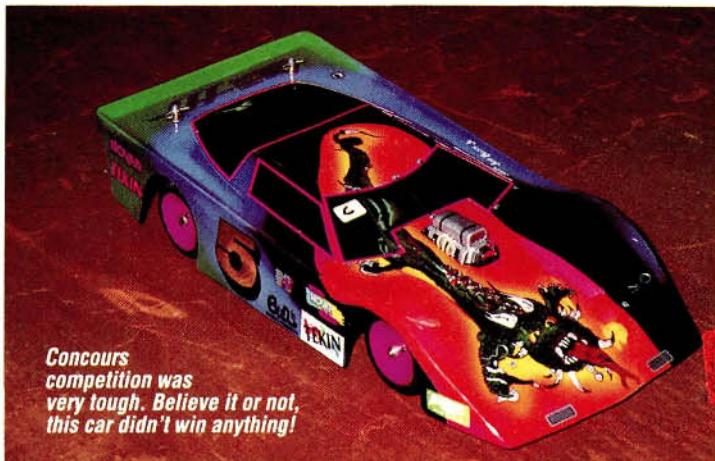
The surface of the track was unlike anything I had ever

seen. It was packed—nearly polished!—red clay with very few bumps, and this made for fast,

tency; except for its color, it was very similar to the clay I used in school, and I was able to form it into little animal figures!

The clay track remained consistently smooth all weekend and didn't need grooming. Occasionally, a crash would result in a small surface hole, but that was fixed by a glob of clay and a firm stomp of the foot!

On the night before the race, *Car Action*



consistent runs throughout the weekend. Although area natives were used to it, this red clay was quite foreign to a New Yorker like me. I picked up a small piece to check out its consis-

Editor Steve Pond and I talked to racers at our hotel, who told us that foam tires coated with silicone rubber had been working well. When they showed us a set, I was very impressed. Apparently,

they mount the tires on a drill, coat them with the clear or black "goo" and then spin them to let the excess fly off. Then they wet their hands and smooth the surfaces to a glass-like finish. The process takes time, and the tires have to cure overnight.

The first two qualifiers were held on Friday, and this gave me a chance to sneak around the pits and look for new things. Team Pit Stop had its 2WD Novas ready for battle. In the 2WD Open Class, Jim Dieter drove a scratch-built prototype with a fully enclosed direct-drive transmission, but the most interesting thing to me was the Custom Works sprint car. Based on the Intimidator and outfitted with a beautiful aluminum roll cage, this car did some serious intimidating in the Outlaw Sprint Class!

The next day of qualifying went just as well. J.R. Sitman and the people of NORRCA did a great job of running the event. At the end of each race, a recorded voice counted down the 2 minutes before the next one, and this let everyone know when to go to tech, line up and clear the grid. This method worked extremely well and didn't waste any time.

QWAZY QUALIFIERS

John Walters led the pack in the 2WD Stock Class with 34 laps in 4:01.79. Six out of 10 drivers qualified with 34 laps, and only 3 seconds separated the top



two finishers. Danny Rosenbaum cranked out 35 laps in the 4WD Stock Class in 4:02.05—2 seconds ahead of Shawn Hamby.

2WD STOCK A-MAIN

Fin	Qual	Name	Laps	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	5	Jim Horton	34	J-Car	PTI	Zeta	Futaba	C/W Camaro	Losi	
2	10	Mike Conkey	33	RC10	H	Wolf pack	Novak	Futaba	C/W Camaro	Bolink
3	4	Billy Dean	33	RC10	A	East Coast	Novak	Futaba	C/W Camaro	Bolink
4	9	Steve Roberts	33	Intimidator	N	AEI	Tekin	Futaba	C/W Camaro	TRC
5	2	Ray Turner	33	RC10	D	B+T	Tekin	Futaba	C/W Outlaw Wedge	Bolink
6	6	Terry Ruffy	33	Track Master	O	East Coast	Novak	Airtronics	C/W Camaro	Mini-Tech
7	1	John Walters	33	TPS/Nova	U	PTI	Tekin	Futaba	C/W Camaro	Twinn-K
8	8	Ronnie Garris	32	MIP/RC10	T	Bullet	Novak	Airtronics	C/W Camaro	TRC
9	3	Chad Harris	32	RC10		B+T	Novak	Futaba	C/W Camaro	TRC
10	7	Ken Long	31	Scratch		Smooth	Tekin	Futaba	Premier Vortex	CRP

4WD STOCK A-MAIN

Fin	Qual	Name	Laps	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	8	Jess Belton	35	SRP-1	Revtech	Tekin	Futaba	Bolink Oval	Delta	
2	4	Charles Huckabee	35	SRP-1	Smooth	Novak	KO Propo	Premier		TRC
3	7	Jack Rimer	34	Dominator	A	Triad	Futaba	Rocket Wedge	Jaco	
4	5	Wayne Burgess	34	Dominator	N	B+T	Novak	Futaba	C/W Camaro	Custom Works
5	3	Dave May	33	Dominator	D	East Coast	Novak	KO Propo	C/W Camaro	TRC
6	6	Bobby Quilez	33	Dominator	O	Smooth	Novak	Futaba	Bat Wedge	Delta
7	9	Sean Glazar	33	Dominator	U	Smooth/PTI	Tekin	KO Propo	C/W Camaro	TRC
8	10	Ricky Williams	33	Dominator	T	Hi-Tech	Novak	KO Propo	Pro Lumina	TRC
9	1	Danny Rosenbaum	19	Dominator		Quantum	Tekin	Futaba	Pro Lumina	Custom Works
10	2	Shawn Hamby	2	Dominator		Smooth	Novak	Futaba	Pro Lumina	TRC

2WD OPEN A-MAIN

Fin	Qual	Name	Laps	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	4	Charles Riesbol	39	RC10	Revtech	Revtech	Novak	KO Propo	Premier	TRC
2	3	Warren Darby	37	Intimidator	Revtech	Revtech	Novak	KO Propo	C/W Camaro	TRC
3	5	Seth Ward	37	Equalizer	Twister	Smooth	Novak	Futaba	Premier	Track Master
4	2	Jim Deiter	37	Scratch	Revtech	Revtech	Tekin	KO Propo	Oultaw Wedge	TRC
5	10	Brian Landgraff	37	Intimidator	Trinity	Trinity	Novak	KO Propo	C/W Rocket Wedge	TRC
6	8	George Vardzik	36	Intimidator	Wimpy	Gonzo	Novak	Airtronics	C/W Rocket Wedge	TRC
7	6	David Kiser	35	Intimidator	East Coast	East Coast	Novak	Airtronics	C/W Camaro	TRC
8	9	Bobby Beard	35	Intimidator	East Coast	King R/C	Tekin	KO Propo	C/W Camaro	TRC
9	7	Ken Pohlman	35	Scratch	Revtech	Revtech	Tekin	KO Propo	C/W Camaro	TRC
10	1	Chris Smith	17	Intimidator	East Coast	King R/C	Novak	KO Propo	C/W Camaro	TRC

4WD OPEN A-MAIN

Fin	Qual	Name	Laps	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	9	Charles Huckabee	40	SRP-1	Twister	Smooth	Novak	KO Propo	Premier	TRC
2	4	Gary Warren	40	Dominator	CAM	CAM	Novak	Kraft	C/W Rocket Wedge	TRC
3	1	James Griffith	40	Dominator	East Coast	PTI	Novak	KO Propo	C/W Lumina	TRC
4	6	Rob Cutman	40	Dominator	Trinity	Trinity	Novak	KO Propo	C/W Rocket Wedge	TRC
5	2	Bob Light	40	Dominator	Trinity	Trinity	Tekin	Kraft	C/W Rocket Wedge	TRC
6	8	Craig Carey	38	SRP-1	CAM	Progressive	Novak	KO Propo	Premier	Bolink
7	10	Jeff Floyd	19	SRP-1	Revtech	Revtech	Novak	Futaba	C/W Camaro	Bolink
8	7	Ken Pohlman	3	SRP-1	Revtech	Revtech	Novak	KO Propo	Stealth Wedge	TRC
9	3	Jim Dieter	2	SRP-1	Revtech	Revtech	Tekin	Kraft	Stealth Wedge	TRC
10	5	Brian Landgraff	DNS	Dominator	Trinity	Trinity	Novak	KO Propo	C/W Lumina	TRC

OUTLAW SPRINT A-MAIN

Fin	Qual	Name	Laps	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Bob Light	35	Enforcer	Trinity	Trinity	Nosram	KO Propo	Big Boy Toys	TRC
2	2	Dave Markert	33	RC10	Twister	Smooth	Tekin	Futaba	Premier Gambler	Losi
3	6	Mike Conkey	32	Ascot	East Coast	East Coast	Novak	Futaba	McAllister	Bolink
4	3	John Smith	32	RC10	Twister	Smooth	Novak	Futaba	Premier Gambler	Mini-Tech
5	5	Stephen Miniea	31	TPS Nova	TPS	King R/C	Tekin	Futaba	Premier Gambler	Twinn-K
6	9	Wendell Minter	30	RC10	Revtech	B+T	Novak	KO Propo	Sergeant Sprint	TRC/Bolink
7	10	Jeff Belton	30	Ascot	Revtech	Revtech	Novak	Futaba	Premier Gambler	TRC
8	4	Tyler Clements	28	RC10	Twister	Smooth	Novak	Futaba	Big Boy Toys	Losi
9	7	Jerry Adams	28	Big Boy	CAM	CAM	Novak	Futaba	Big Boy Toys	TRC
10	8	Ed Lands	27	Scratch/RC10	CAM	B+T	Novak	Futaba	McAllister	Bolink

In 2WD Open, there was an impressive jump in the number of laps turned, as three drivers—Chris Smith, Jim Dieter and Warren Darby—managed 39

laps. The 40-lap barrier was broken in 4WD Open, and James Griffith pulled the fastest run of the weekend—40:4:00.00, right on the nose! That's an

average scale speed of 323.8mph! Bob Light set the 36-lap TQ on his first run with the new Enforcer sprint car. The only other driver in this class to

turn 36 laps was Dave Markert (36:4:03.19), who finished 2.29 seconds behind Light.

Concours was held on Sunday morning before the Mains. The

cars looked really great, and some had complete trailers, engines and roll bars. The judging took a long time; picking a winner from a field of cars that are all

DIRT-OVAL NATIONALS

well-designed and nicely painted isn't easy! In the end, Rob Lafferty won 1st and 3rd places, with Jeff Belton sandwiched between in 2nd.

THE MAIN EVENT

It was time for the Mains to hit the grid! In 2WD Stock, TQ John Walters was expected to do very well, but 5th qualifier Jim Horton put on the pressure and closed the door on the

MODIFIED MANIA

Now comes the modified action! The 2WD Open Class included some well-known racers, and once again, the top dog was toppled. Chris Smith only completed 17 laps before he had to call it a day. Jim Dieter's prototype car led the race for the first lap or so, but teammate Charles Riesbol was right on his heels. Riesbol kept it clean, passed Dieter on the



4:06.57—two more laps than Dieter, who finished a respectable

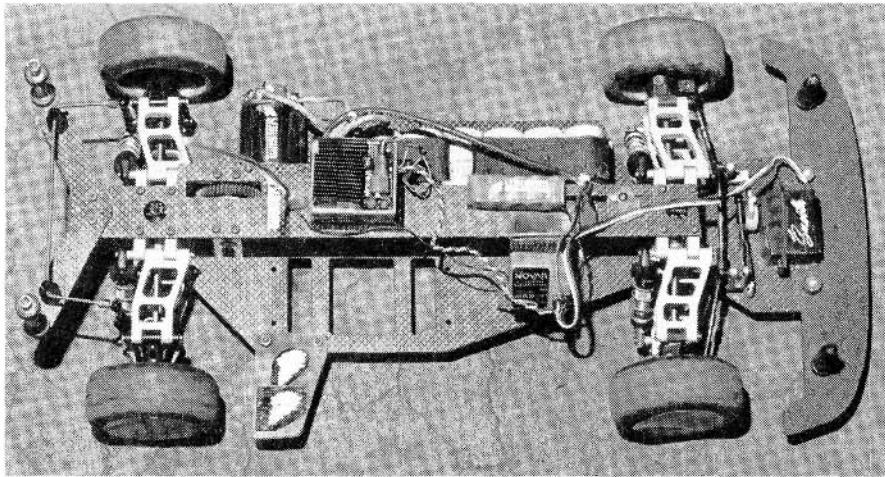
4th. Warren Darby finished 2nd, and Seth Ward slipped into 3rd with only 15 seconds remaining.

4WD Open was one of the best races of the weekend! Unfortunately, Brian Landgraff's speed controller fried on the line, and he was unable to start. Jim Dieter led the race for

the first two laps, and people were sure he had the win sewn up,

but an accident sheared off a wheel, and he was out. TQ Gary Warren led until Charles Huckabee, who qualified 9th, surprised everyone! He turned in the second-fastest race of the weekend—just .40 second behind the top time of the day. Gary Warren and James Griffith also completed 40 laps to come in 2nd and 3rd. "Rad" Rob Cutman and Bob Light battled for 4th; Rob held on to finish .58 second ahead. Both drivers completed 40 laps.

Far and away the day's most exciting race was the Outlaw

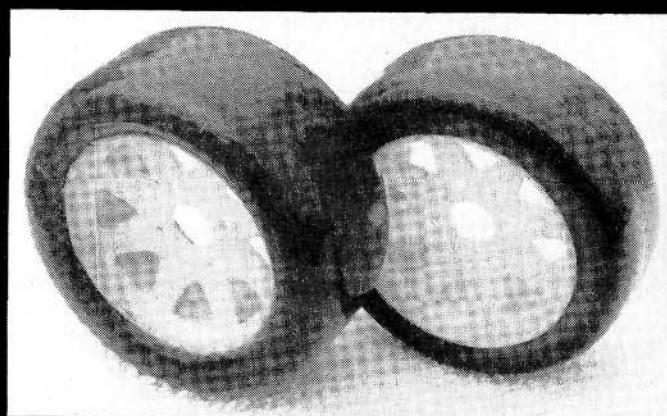


Charles Huckabee's winning SRP-1. Notice the Lexan receiver mount on the upper plate.

field. He was the only one in the race who turned 34 laps, and he finished in 4:03.16. It was a close call between 2nd and 3rd; only .55 second separated Mike Conkey and Billy Dean!

In 4WD Stock, another top qualifier was pushed aside. Jess Belton, the 8th qualifier, was able to hold off Charles Huckabee by .39 second to go on for the win. Danny Rosenbaum and Shawn Hamby, the top two qualifiers, were both cursed with bad luck in the Main, and they finished 9th and 10th, respectively. I hate it when that happens!

SUPER SILICONE



The hottest items at this event were silicone-coated foam tires. At first glance, they didn't look good for high traction. They have a rather high profile when compared with radials (which no one used). Their smooth-as-glass surface looks wet even when the glue has totally cured. We heard conflicting reports on the brand

Sprint Class. By the time the pack turned the first lap, the crowd was excited. The cars were closely matched, and this made driving skill very critical. More than once, we saw a big pile-up in which most of the cars were involved—except the "Lightman." He managed to steer through accidents that seemed unavoidable!

Tyler Clements grabbed the lead after being in 2nd place for more than a minute, but he fell back when something went wrong with his car. Bob Light had the crowd cheering after every close call, but he never looked back. He completed 35 laps in 4:04.67. His closest competitor, Dave Markert, was two laps behind.

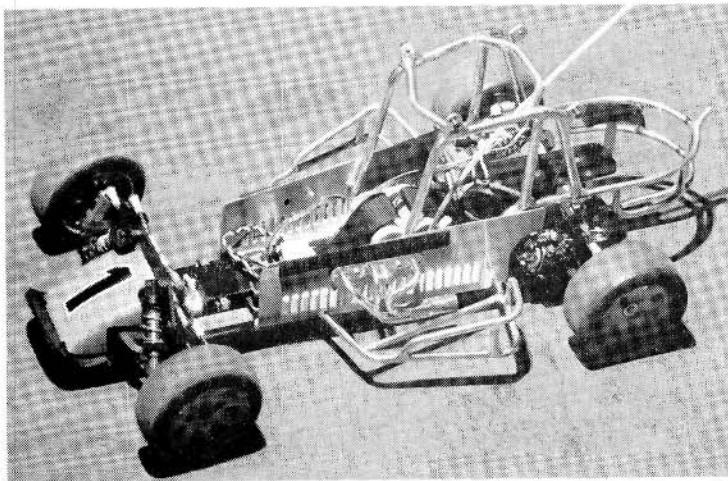
GRAND THEFT AUTO??

After all that, we were ready for some food. Steve and I met some of the guys from Custom Works at a restaur-

rant, and we talked about all that had happened. We hung out and had a ball until we realized it was time to go if we were to catch our plane the next morning. As we left the restaurant, the whole weekend came to a grinding halt! In the parking lot, I turned to Steve and said, "Didn't we park the car right there?" This was all we needed!

Steve took the whole thing very calmly, but I was flipping out! The car was full of cameras and, more important, all the film! It wasn't hard for me to believe that it had been stolen; we had locked the keys in it the day before and were able to break in in minutes. Someone went to call the police, and I sat down to bum out. The next thing I knew, Joel Johnson pulled around the corner in our car! They got us good, but we won't forget! Watch out next time! ■

This is the prototype of Custom Work's new Enforcer sprint car.



John Walters of Team Pit Stop with their new Nova.



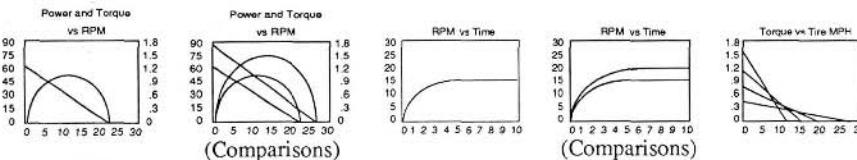
Charles Riesbol's winning RC10. Notice the antenna loom that remains inside the body.



of silicone used to make these tires: some told us that choosing the correct brand was critical; others said that it wasn't.

Members of the East Coast Racing Motors team told me that they were the first ones to try these tires on a clay oval, and they had tremendous results. The hard part was keeping them a secret! Even hiding the tires in the pits and keeping the car covered until the race started didn't help. Within no time, the local hardware stores all were sold out of silicone! The East Coast team recommend the G.E. brand.

The tires held out pretty well, but they started to show signs of wear after three runs, mainly because the layer of silicone is so thin. The only problem with them is that you have to make them yourself. Making a set of four could take you 45 minutes, and you'll definitely make a mess. I don't know whether anyone plans to sell them, but if they do, I think they'll be expensive. For now, why not make what you need? I'd like to know whether they'll work well on any other type of surface, but that remains to be seen.

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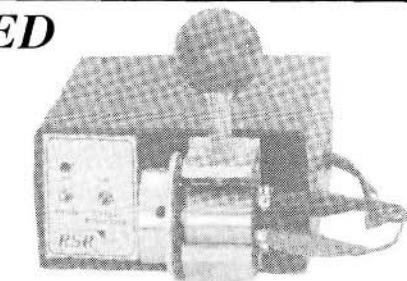
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**THUNDERDROME**

(Continued from page 158)

lister as well as to all the other manufacturers who contributed to the event or participated in the races.

Thanks to all the participants of the R/C Thunderdrome, and congratulations to all the winners from *Car Action* maga-

zine. See ya next year!

Special thanks to: Steve Schooler of One-Stop Raceway (on-site hobby shop and computer scoring); Hal Sanguinetti—Announcing; Neil Van Order—Universal Studios; Leonard Lee—Computer hookups; Bob Sarnelle—Electrical hookups; Steve Pritchett—Balloon release; Bev Pritchett—Security; Bob Evans, Eagle Products—Banners and bumper stick-

ers; Cerwin Vega—Sound system; Applause—Minicars; Indian Head Water—Water; Al Messing—Tech and transmitter impound; Brian Cross; Carrie Lee; Brian Prince; Tami Mintz; Danielle Lee; Jason Keeney; David West; Mike Johns; Dave Pulfer; Steve Pritchett; Ken Moon.

Thanks to these manufacturers for providing prizes:

(Continued on page 178)



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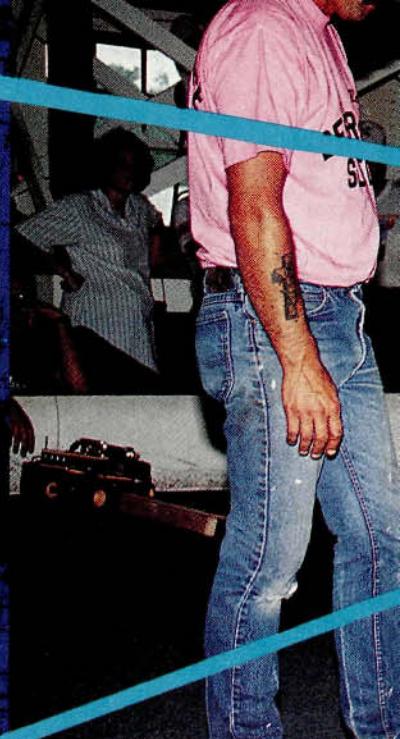
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Jay Heiser's highly modified *Clod* took 1st in the Monster Truck Concours. It also did well in the pulling events—plenty of show and go!

IN CASE YOU'VE BEEN visiting relatives in some distant galaxy and haven't seen the monster-truck and tractor pulling contests on ESPN, this sport is one of the hottest things going! There's a class for everyone—from the 2WD, stock, monster-truck car crushers to the unbelievably powerful 4WD open pullers!

K&N R/C Speedway in Stafford Springs, CT, recently hosted the National Radio Control Truck Pulling Association's (NR/CTPA) East Coast National R/C Truck Pull and Monster Truck Competition. This unique event was sponsored by Kyosho and *R/C Car Action* and presented by R/C Motorsports International.

One hundred and twenty-one competitors showed up—from as far away as Texas, Illinois and Canada!—and prizes and trophies were up for grabs in 18



truck PULLS

by JIM SHEPKA



cial rules for each class! Fortunately, NR/CTPA President Dave Sproul was on hand to offer his expertise and assistance.

classes.

Since this was my first NR/CTPA event, I prepared for it by reading a copy of the rule book. After all, how can you play the game if you don't know the rules?! Little did I know how much time it would take to become familiar with this encyclopedia of knowledge and gamesmanship! Aside from the 25 or so general rules, there are as many as 13 spe-

■ Far left: Vincent Gamache's *Clod* took 2nd in Monster Truck Concours.

■ Below: Wayne Grundy's "Prospector" 2WD puller took 2nd in Scale Truck Puller Concours, 2nd in Open I and 3rd in 2WD Sportsman.

■ Far right: "Bad Attitude." Bill Phillips took 4th in 2WD Sportsman Class.

■ Top right: Joe Nawarskas' "The Other Woman" took 2nd in the Monster Puller Concours.





truck PULLS

WHO'S GOT THE LOOK?!

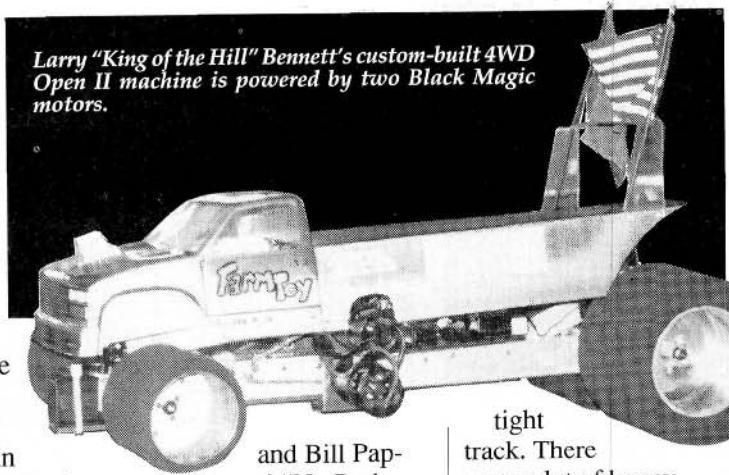
Before each day's qualifying runs, concours was held in those classes. Jay Heiser took top honors in the Monster Truck Class; his beautifully prepared rig had a tilt bed and hood, full lights and chrome parts everywhere! Vincent Gamache came in a close 2nd, and Domingo Colon Jr. rounded out the field with his "Equalizer."

In the Stadium Truck Class, George Ruff's "Bud"-mobile looked as if it had just come off the Mickey Thompson racing circuit! Vincent Gamache made it a "two-fer" with his matching stadium racer, and Jeff Winzens took the bronze.

The incredibly detailed scale truck pullers and monster pullers were crowd favorites, but there were so many beautifully prepared vehicles that judging was difficult. Paul Spooner's "Undertaker" came out the top dog, followed by Wayne Grundy's "Prospector" (my favorite!) and Roger Alphone's "Long Tail."

Mike Guertin's awesome "Showtime" was the hands-down winner in the Monster Puller Class; Joe Nawarskas' "The Other Woman"

Larry "King of the Hill" Bennett's custom-built 4WD Open II machine is powered by two Black Magic motors.



and Bill Papas' "No Problem" clinched the two remaining spots.

The painstaking detail, chrome work, custom-made parts and machinery presented at this event were the best I've ever seen. This group of hobbyists is definitely a breed apart!

KILLER TRACK

A "Christmas tree" was set up in the middle of the track, with identical courses to the left and right. Competitors made two passes through the course, and at least two of their vehicles' wheels had to pass over an obstacle, or they were given a 2-second penalty. Track marshals aren't usually allowed to right overturned vehicles, but the rules committee (headed by Doug Avery) had a change of heart and allowed a "once-over" rule because of the

tight track. There were a lot of happy faces after that decision!

The first round of qualifying was set for Saturday morning, and keeping to a tight, orderly schedule, the stock monster trucks and pullers were called to the line. The monster and stadium trucks navigated the course's jumps and car-crushing pits side by side against the clock. With the short straights and tight

■ *Top: Anticipation of the start! The course was a killer!*

■ *Bottom: Amazing amounts of time are spent preparing for the moment of truth.*



truck PULLS

turns, the competition was *stiff*.

The Blackfoot was

the vehicle of choice in 2WD Stock; the top seven drivers drove one. Claude Kuzmiak took the gold, and Peter

Gobin and Leo Breault fought it out for 2nd with some very competitive times.

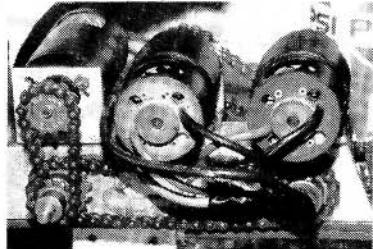
In the 4WD Class, the entire field drove Clod Busters. (Do you sense a pattern here?!) Vincent Gamache followed his Concours win with an equally impressive 1st-place run, followed by George Gendron (of Willimantic, CT) and Brian Sasseville in his Trinity-powered ride.

PULLING POWER!

The monster-truck racing over, it was time for the awesome power of the pullers! The pulling surface was a 30-foot carpet lane that had been prepared and marked for distance. Each puller qualified with a given weight, and "pull-offs" were run when at least two vehicles had pulled that load the full distance. A run was considered complete if the sled crossed the finish line

W I N N E R S

Name	Motor	Speed Controller	Chassis	Weight & Distance
2WD STOCK				
Ron Crawford	Black Magic	Novak	Pumpkin	19' 4 1/4" @ 45 pounds
John Amann	Kyosho	Stock	Blackfoot	18' 5 1/4"
Paul Lavecchia	Black Magic	Stock	Monster Beetle	18' 1"
2WD SUPERSTOCK				
Roger Maynard	Kyosho	Stock	Big Brute	25' 1 3/4" @ 60 pounds
Ken Moore	Kyosho	Stock	Blackfoot	20' 8 1/2"
Paul Morziani	Parma	Parma	Parma	12' 5 3/4"
2WD MODIFIED				
Roger Maynard	Astro Flight	Zeta	Big Brute	26' 9" @ 95 pounds
Doreen DeJohn	Black Magic	Zeta	Blackfoot	18' 4"
Joe Baril	Astro Flight	n/a	Lunch Box	12' 6"
2WD SPORTSMAN				
Andrew Lee	n/a	n/a	Bennett	26' 9" @ 110 pounds
Richard Morrisseau	Black Magic	Robart	Scratch	25' 1 1/4"
Wayne Grundy	Black Magic	Robart	Scratch	16' 1/4"
2WD OPEN I				
Roger Alphonse	Astro Flight	n/a	Scratch	25' 10 1/2" @ 210 pounds
Wayne Grundy	Astro Flight	Robart	Scratch	21' 8"
Richard Morrisseau	Astro Flight	Robart	Scratch	20' 1 1/2"
2WD OPEN II				
Scott Weigel	Astro Flight	n/a	Scratch	22' 10" @ 300 pounds
Peter Kulesza	Astro Flight	n/a	Scratch	20' 4"
Tom Riney	Kyosho	n/a	n/a	25' 4 1/4" @ 210 pounds
4WD STOCK				
Daryl DeJohn	Trinity	Stock	Clod Buster	Full Pull @ 35 pounds
Ron Crawford	Black Magic	Futaba	Yokomo	DNS
4WD SUPERSTOCK and MODIFIED				
Wayne Rydz	Black Magic	Novak	Bruiser	Full Pulls @ 50 & 65 pounds
4WD OPEN I				
Russ Sirais, Jr.	Trinity	Robart	Scratch	Full Pull @ 120 pounds
Domingo Colon	Astro Flight	Zeta	Bruiser	12' 10"
Charles Wojack	Astro Flight	Zeta	Bruiser	1'
4WD OPEN II				
Larry Bennett	Black Magic	Zeta	Bennett	Full Pull @ 311 pounds
Chuck Wojack	Black Magic	Zeta	Bennett	23' 1 1/2"
Richard Mogle	Kyosho	Zeta	Scratch	20' 2 3/4"
DUAL-MOTOR STOCK				
Gary Diehl	Trinity	Robart	Clod Buster	20' 4 3/4" @ 100 pounds
John Norcross	Stock	Stock	Clod Buster	18' 2"
Edward Kraemer	Stock	Novak	Clod Buster	16' 1/4"
DUAL-MOTOR MODIFIED				
Ray Wolfe, Jr.	Astro Flight	Zeta	Clod Buster	Full Pull @ 200 pounds
Coleman Clark	Astro Flight	Zeta	Clod Buster	20' 9"
Bill Pappas	n/a	n/a	Clod Buster	20' 5 1/2"



A homemade chain-drive transmission supplies the power necessary to haul hundreds of pounds.

for the hardware, the 2WD Modified Class had the largest field. The top two Super Stock drivers continued their winning ways in Modified—using virtually identical setups to sweep both classes. Ruff and Avery beat Paul Raines, who took the bronze with a Trinity-powered JR-XT.

In a very clean run, Ron Crawford (of

or side lines, or if the vehicle just couldn't go anymore! A 1-minute time limit was also enforced. With the judges ready and the fire bottles in place (a safety feature—these pullers have been known to go up in smoke!), the 2WD Stock Class got things underway.

(Continued on page 234)

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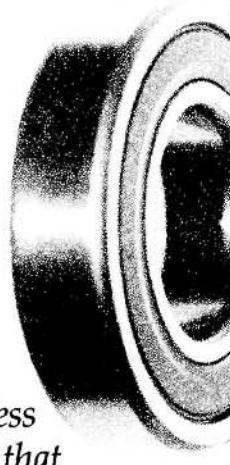
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THUNDERDROME

(Continued from page 166)

Airtronics; Associated; Boca Bearings; Bolink; Bud's Cobra; Coverite; Cheetah Racing; Dan's RC Stuff; Delta; Edge; Futaba; HPI; Hyperdrive; McAllister; Paragon; Parma; Progressive Technologies; Pure Tech; R/C Car Action; Quantum; Revtech; Saiko; Sign Art; Stage Three; Twinn-K; Tekin; Zeta.

CRABIN' CLOD

(Continued from page 64)

I use the gear up/down channel for the trailer dump-bed servo. When I turn it on, the servo horn pulls on the spring-loaded lock, and the hydraulic cylinder raises the dump-bed. When I turn it off, the lock returns to its original position.

The headlights and spotlights are on two separate channels, and when I activate them, each servo horn pushes a microswitch that turns them on or off. I hooked-up the Clod's throttle control to the rudder-control stick on the radio, and its turn-signal servo to the throttle-control stick. This works well, because when you push the stick to the right, the Clod moves forward; if you push it up at the same time, the left turn signal comes on; push it down, and the right turn signal comes on. When you move the stick to the left, the Clod reverses.

STUNNING STEERING!

I removed the original, single, S148 Futaba servo and mount and made a new one out of a piece of phenolic block. I attached it to the chassis by using the three screw holes that were used by the original mount. The new servo mount holds two, S131, high-torque Futaba servos upright and side by side with the servo gear toward the bottom and the servo horn pointing straight up. I made a top support mount to join the servos and prevent them from twisting under heavy loads. To make it fit over the top servo support, I had to cut the battery pan that holds a receiver pack along its center. This also helps to prevent the servos from moving from side to side. I hooked-up the servos to the stick on the right-hand side of the radio (used for the ailerons and elevator on an airplane). This gives the Clod eight-position steering on one stick.

Here's how it works: when you move the stick left or right, only the front wheels turn; move it up or down and only the rear wheels turn (left or right); move the stick

(Continued on page 190)

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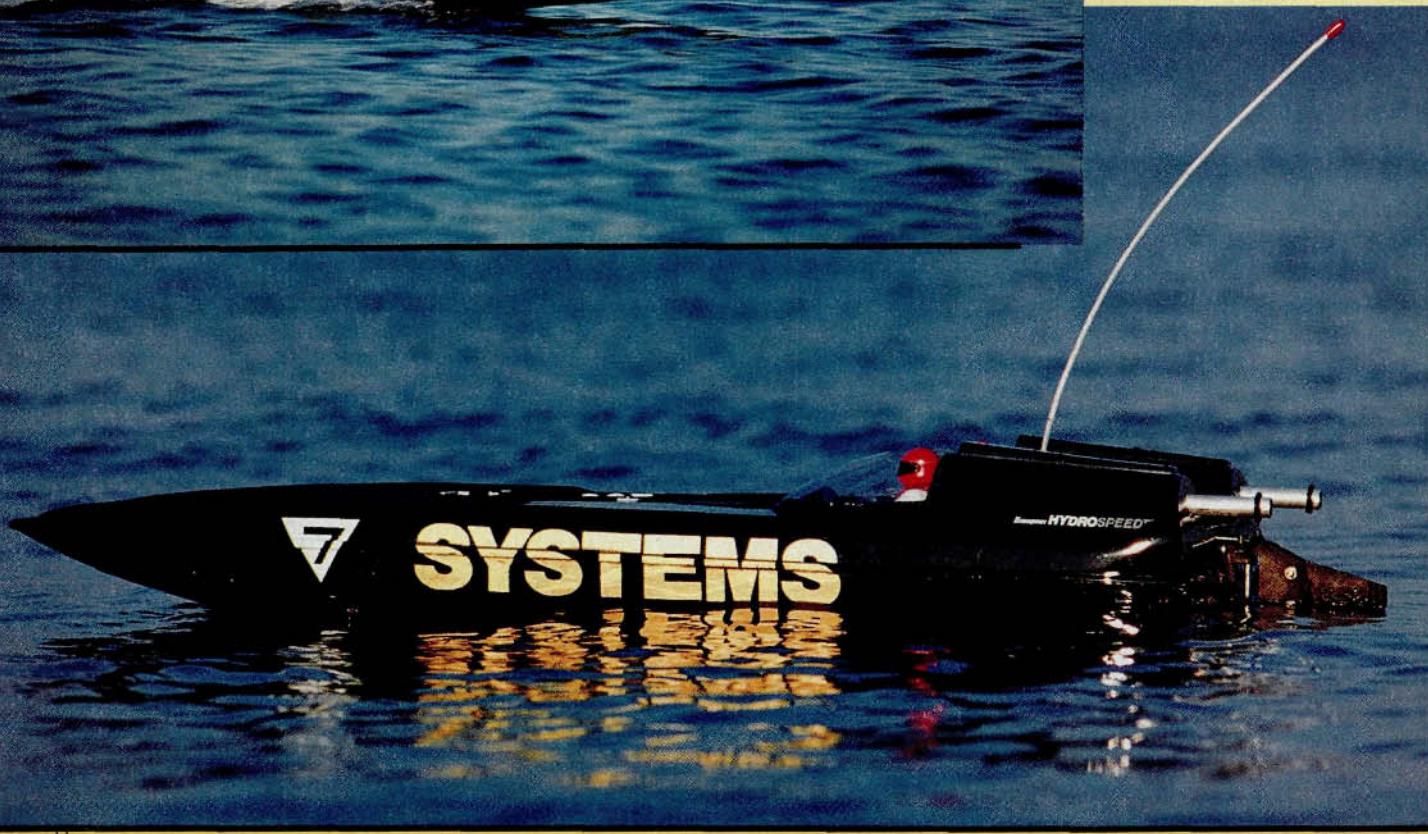
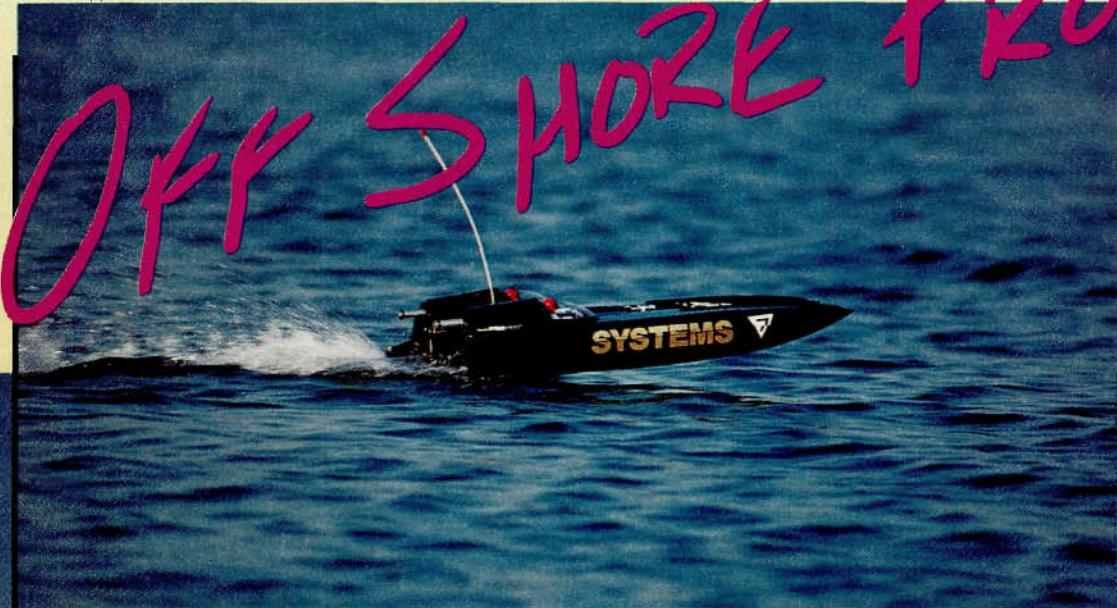
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OFF SHORE PROWLER



Above: One of the most true-to-scale fast electrics, the Systems Cat looks as if it's going at 100mph, even when it's sitting still.

by STEVE POND

OFFSHORE RACING is one of the biggest challenges in the full-scale boat world. Unlike auto racing, which takes place on a relatively predictable surface, the ocean

presents myriad obstacles that change constantly.

Although the latest technological advances enable boats to travel at ever-increasing speeds, the route to present

achievements has been tainted by a number of tragic accidents. Early racing boats were just overpowered cruisers that were good enough for their intended use, but by

SYSTEMS

no stretch of the imagination were they up to the task of handling the punishment of offshore racing.

In the early '70s, we began to see boats designed specifically for offshore racing: the deepvee configuration. The lower, leaner stance of the deep-vees not only pushed them toward 100mph-range speeds, but also made them more capable of managing the ocean and its dangers. This vee configuration has been successful on the racing circuit, but improved engine technology has led to a demand for a superior design for safer

navigation; hence, the birth of the catamaran. Catamarans (or "cats") are on the leading edge of technology and allow faster speeds than ever before.

Technological developments didn't stop with the boats' exteriors. Their captains now handle the controls from a comfortable seat, instead of from the stand-up, kidney-wrenching "bolsters" of old. Some of the more contemporary designs even have high-tech fighter-plane cockpits and canopies for their drivers. In short, the newest boats offer a safer, faster ride.

SPECIFICATIONS

Type: Offshore catamaran

Scale: $1/13$

Length: 33 $\frac{1}{4}$ inches

Beam: 10 $\frac{3}{4}$ inches

Drive: Gear-reduction steerable surface drive

Ratio: 2:1

Motors: Two Graupner Speed 600s

Speed Controller: Graupner variable resistor

Battery Req'd: 7.2V to 8.4V

Sug. Retail: Hull, \$97; drive, \$93; speed controller, \$45.80.

Comments: Beginners might find construction difficult, but it goes smoothly as long as you "read between the lines" of the instructions. The stock plastic prop allows good performance, but the boat would perform better using a prop with a larger pitch. Its width allows the Systems boat to handle exceptionally well, even in rough water. It shows excellent performance potential.

What's the relationship between these mega-buck machines and R/C boat racing? R/C model enthusiasts and boat manufacturers have benefitted directly from the decades of grueling R&D

that has gone into the full-scale boats. One example of this scaled-down technology is the new Graupner Systems electric*

(Continued on page 183)

SYSTEMS

(Continued from page 181)

offshore catamaran.

The catamaran design has been popular among nitro racers for some time, and now it's offered to electric enthusiasts in this competitive, high-performance package. Moving a heavy fiberglass hull has never been a problem for an ultra-powerful glow engine, but the limited power of electrics made fiberglass less attractive than the lighter plastics. The difficulty of molding a catamaran hull in plastic has previously limited its ability to compete with the wide variety of high-performance vee-bottom boats; but this has changed.

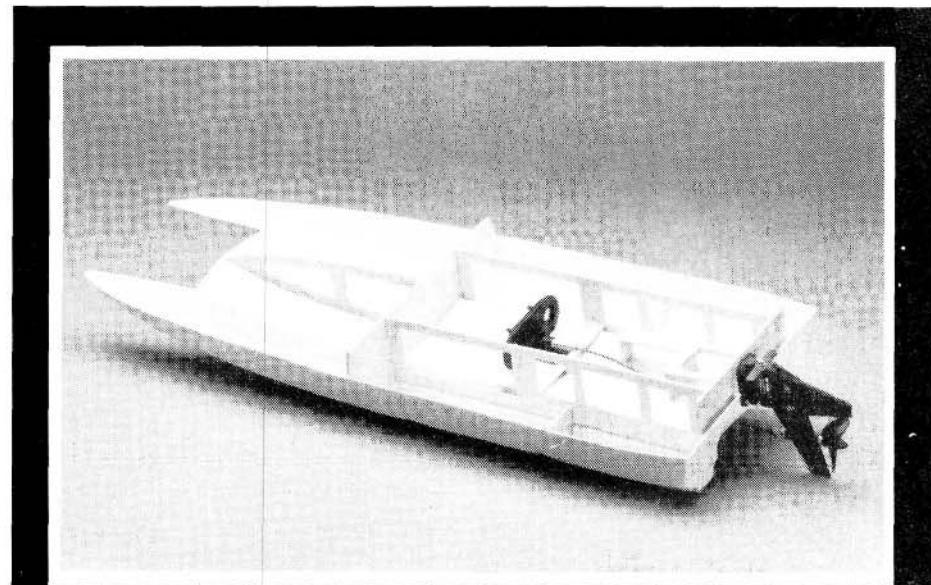
KIT CAT

The Graupner Systems catamaran has a vacu-formed ABS plastic hull that's supported by model-grade plywood formers. For propulsion, the hull is designed to accommodate the new Graupner 606 Hydrodrive. This new drive system includes a low-profile, twin motor mount with a 2:1 gear reduction that, unlike the previous Monster Drive, will fit inside a cat hull.

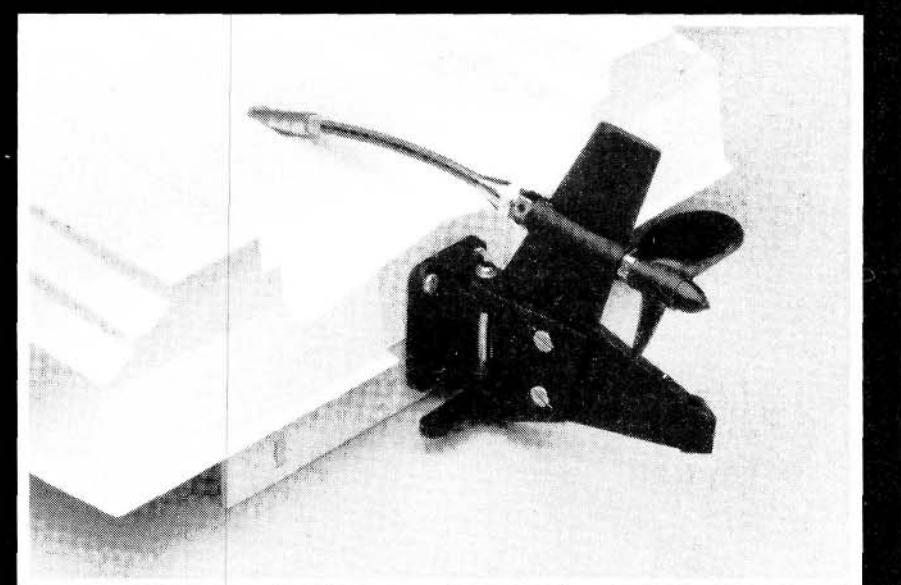
Connecting the two motors to the familiar Graupner outdrive is the new flex-cable assembly that's like those used in gas and custom electric boats. Rounding out the package is a Graupner, mechanical, variable-resistor speed controller. Each of the three elements (hull, drive and speed controller) is available separately for those with more building experience who would prefer to use different equipment. Those with limited building experience should stick with the Graupner hardware; installation is described in the instructions.

CONSTRUCT A CAT

For a proper fit, trim the excess plastic off the edges of the hull before you join its upper and lower halves. If you pay attention here, later on, you'll have a trouble-free fit when you glue the halves



The plywood formers that are cemented into the hull make the Systems boat exceptionally rigid. Note the large battery areas just behind the main bulkhead in both pontoons.



The new Monster drive designed for the Systems boat is similar to the old one, except for its high-performance flex cable.

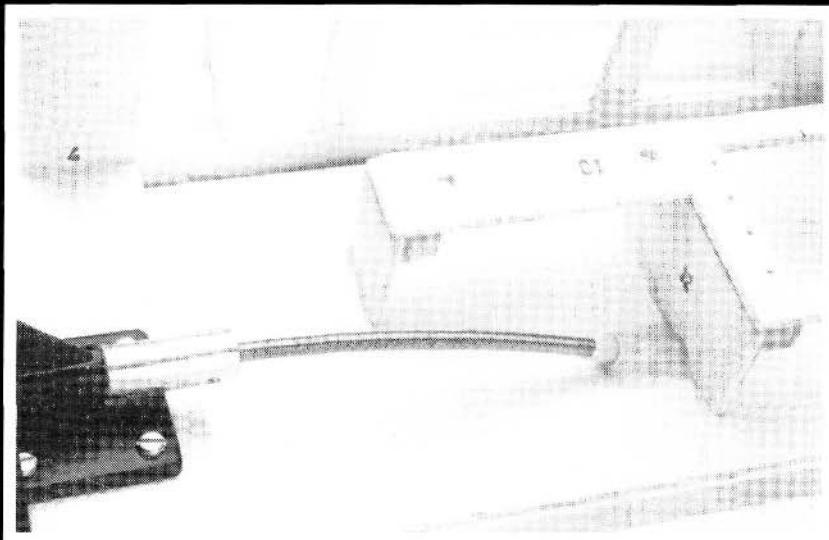
together. With the trimming complete, install the plywood hull formers. Take care with this, too, if you want to enjoy this boat for a long time. The formers are die-cut from lite-ply material that's exceptionally strong, but not very water-resistant. Before assembly, treat the wood with some type of

water repellent or a thin coat of fiberglass resin.

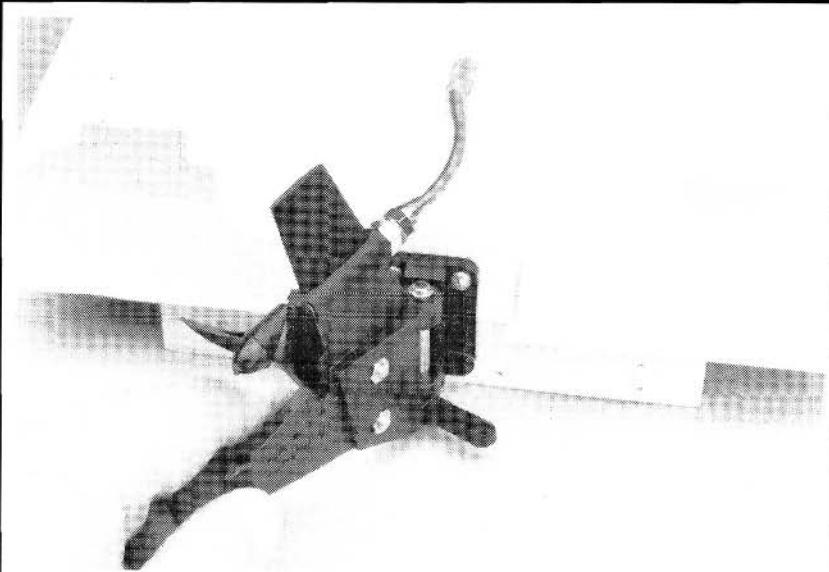
To fasten the formers to the hull, use the included Stabilit Express epoxy, which forms a super-strong bond and cures in 8 minutes. Although it takes longer to cure than fast CAs, it's well worth the

(Continued on page 184)

SYSTEMS



To ensure a rigid, waterproof seal, the aluminum/nylon tube that supports the flexible cable as it passes through the hull, receives a liberal application of epoxy.



If the drive is turned too far, the flex cable will be distorted, but the 5- to 10-degree steering limit recommended in the instructions is enough to turn the boat.

wait, because brittle CAs loosen easily. The epoxy's slower curing time might be an inconvenience if getting on the water quickly is a priority, but it allows you to move the parts if they don't seat properly the first time. A few cautionary words: ensure that the parts are in the right places before the cement

dries. You won't be able to separate them without seriously damaging them.

As long as you follow the instructions, assembly should go smoothly. You might have to read between the lines (a lot is lost in the translation from German), but the full-scale drawings will help when

(Continued from page 183)

the instructions aren't clear.

By keeping an eagle eye on the instructions, I was able to get through most of the construction without a hitch, but in the finishing stages, there's one part of the instructions that should be modified. When you join the upper and lower halves of the hull, the instructions recommend that you make an airtight seal with epoxy in the area in front of the large center bulkhead. (I assume that this sealed space is supposed to provide flotation.) Well, according to Murphy's Law, water will find its way into an "airtight" space faster than it will find its way out. I recommend that you install some type of flotation material, e.g., light foam. Sealing this compartment takes liberal amounts of adhesive along the edges of the bulkhead and in the seam between the two parts of the hull. This might work well, but if you misalign these parts, you'll have problems when it's time to bond the entire seam. (The instructions suggest that you allow the glue that seals the bulkhead to dry before you join the halves completely.)

To avoid some of the potential complications, fill the space forward of the bulkhead with some type of flotation material, and then cut a small semicircle in the bottom of the main bulkhead before installing it. This will allow water to drain easily out of the hull. Naturally, you should do this before you join the deck to the hull.

If you decide to go for the *water-tight* approach, apply epoxy to the top edges of the bulkheads, and then, with the top of the hull in place, quickly turn the boat over and tack the halves together with CA. (Use very little. This will keep the halves of the hull aligned while you apply pressure until the epoxy dries.) Allow the assembly to sit for approximately 20 minutes, then finish bonding the seam with a lot of slow CA (e.g., Flex Zap, which

(Continued on page 244)

CRABIN' CLOD

(Continued from page 178)

to the right top corner or left lower corner, and you have 4WS. Finally, if you move the stick to the left top corner or the right lower corner, you have a Crabin' Clod that moves to the left or the right.

To prevent the Clod from wandering around while I'm trying to steer, I cut out a Plexiglas guide and placed it over the stick, so I can find the steering positions easily. The steering servos also have dual-rate switches on the radio and, when it's turned on, the servo travel is reduced by 40 percent, and this provides a wide turning radius.

There are two more little items: the two light switches that I mentioned earlier are now battery master switches. One is for the turn signal 9V battery, and one is for the 12 AA batteries that power the lights. This prevents the batteries from draining their power.

So, does the Crabin' Clod have 16-position steering, or 24 positions? I'll let you figure it out!

*Here are the addresses of the companies mentioned in this article:
MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.
Kyosho; distributed by Great Planes Model Dist., P.O. Box 4021, Champaign, IL 61820.
DuraTrax; distributed by Great Planes Model Dist., see above.
RAM, 4736 N. Milwaukee Ave., Chicago, IL 60630.
TMS Enterprises, 148-A Del Amo Blvd., Torrance, CA 90501.
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

certainly prevent further stripping there, but it still doesn't prevent the counter gear from stripping or the bracket from cracking.

Also, two button-head Allen screws that hold the spur gear on the adapter rub the gear cover. Run the gear until it wears away enough to run freely, or try sinking-in some tapered, flat-head screws for more clearance.

When I was just about ready to surrender to racing in the stock class or risk breaking gears in modified, Stormer Racing* introduced a unique, counter-gear aluminum bracket to replace the plastic one. This seems to have cured the problem with the gears, because it provides much more rigid support for the counter gear.

I had a problem keeping the battery pack in the Hi-Lux because of the weak tabs on either of the battery slot. These tabs are attached to the chassis and hang down over the battery slot. To insert the battery, one of the tabs must be bent out of the way, and once the battery is in place, it snaps back. The tabs were too weak to hold the battery in place during hard cornering. I fastened both tabs closer to the end of the battery box with a couple

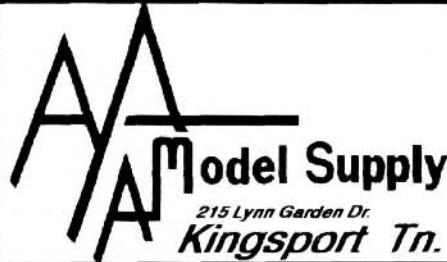
(Continued on page 192)

TAMIYA HI-LUX

(Continued from page 85)

sion, which performed consistently well. But (there's always a "but"), further testing revealed that modified motors may put too much stress on the external gears of the Hi-Lux tranny.

Because of the drastic increase in horsepower, the U-shaped bracket that supports the shaft on which the counter gear rides developed a small crack. This allowed the bracket to flex excessively under acceleration, and the resulting change in gear mesh eventually stripped both the counter gear and the small gear on the rear of the spur. To remedy this, I installed a Robinson Racing* cluster gear. Central to its design is a metal inner gear to which specially made spur gears can be adapted. The metal inner gear will



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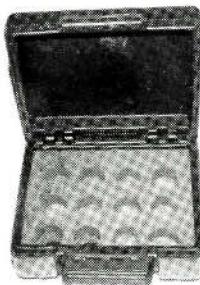
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TAMIYA HI-LUX

(Continued from page 190)

of twist ties, and this increased strength
without making it difficult to remove the
battery.

Apart from these problems, the Hi-Lux
was a respectable performer. With a few
modifications, it's capable of hangin' with
the pack. It's not as versatile as some of
the other race-bred trucks, but it's easy to
assemble and maintain. If the aforementioned
modifications are made to the truck, the only limiting factor should be
your driving.

*Here are the addresses of the companies mentioned in this article:

MRC/Tamiya, 200 Carter Dr., P.O. Box 267,
Edison, NJ 08818.

Team Losi, 1655 E. Mission Blvd., Pomona, CA
91766.

Tekin Electronics, 970 Calle Negocio, San Cle-
mente, CA 92672.

Futaba Corporation of America, 4 Studebaker,
Irvine CA 92718.

Trinity, 1901 E. Linden Ave., Linden, NJ 07036.

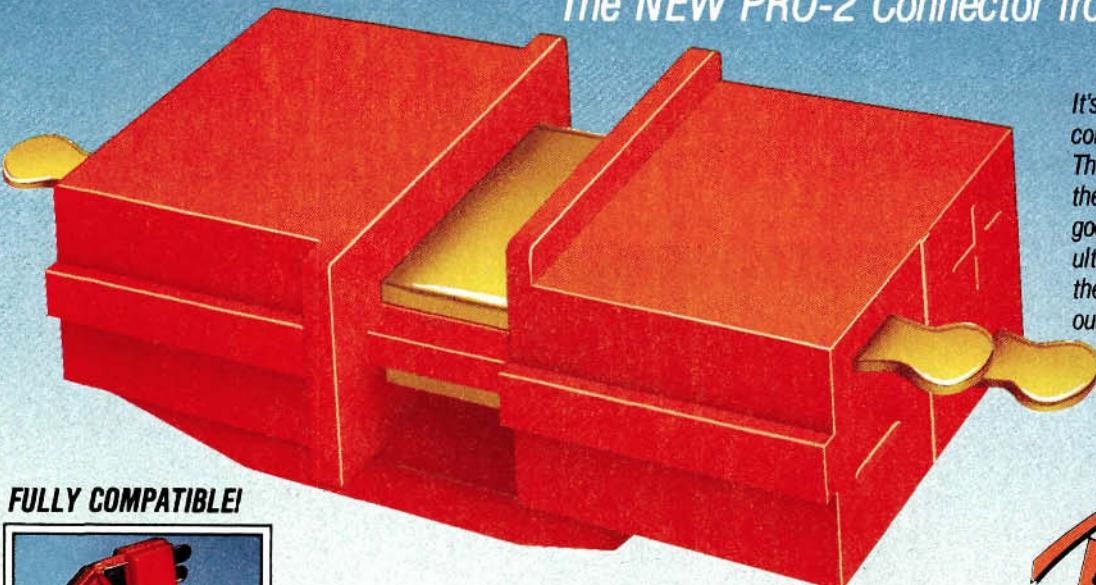
Sees Precision Machine Works, 1414 W. 134 St.,
Gardena, CA 90249.

Robinson Racing, 165 N. Malena Dr., Orange, CA
92669.

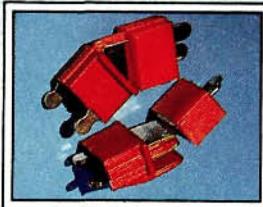
Stormer Racing, 31 Garden Terrace, Glasgow, MT
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CONNECTOR INSPECTOR

(Continued from page 96)

plugged the string of connectors into the pack, creating a dead-short across it. The current jumped to 90 amps and smoke poured out.

The test lasted only about 30 seconds, but the generic connector's flimsy, plastic-coated, 16AWG wire had burnt into two pieces. An inspection revealed that all but the generic connector had survived. (Its case had melted, and its contacts were welded together.)

The other test casualty was the battery pack. The high resistance of its flimsy metal tabs and skimpy spot welds caused extreme heat, and its plastic coating melted and caught fire. When you set up a competitive machine, don't forget: the juice that flows *into* the motor *also* flows through the straps between the cells. I've made a "wimpy" battery pack usable by putting braid between its cells.

Although the other connectors survived, the Team Associated Tamiya-style connectors got warm and their plastic cases softened. The bullet-style motor connectors still worked, but their plastic covering had started to melt. The Sermos

Power Pole connector fared the best. It stayed cool and wasn't damaged at all.

COMMENTS

Here are my impressions of the "trick-class" connectors:

● **Sermos Power Pole.** These clearly win in the performance category! I don't use anything else. They work equally well as battery or motor connectors. In my car, I hard-wire the motor and, in the pits, I keep a 40W soldering iron hot (this makes removing a hard-wired motor a 2-minute project!). I use the Sermos connectors as battery connectors. I think that a .1-percent loss in performance is acceptable for the convenience of not having to solder in my batteries.

On the down side, the Sermos connector is a little tricky to install. I found that Stage III Super 13 wire fits perfectly in the connector contact's barrel. When you solder, don't let any solder flow onto the connector's contact part (solder is eight times worse than silver at conducting electrons). On the other hand, you need enough heat to ensure a good joint. It takes a long time for the monster wire and contact to cool, so allow adequate time for the joint to set before you move the wire.

It would be a shame to reduce your car's performance because of a broken solder joint.

When you insert the wire/contact into the housing, be sure the contact "snaps" into place. Its curved end must go over the spring's end to lock into place. I've seen races lost because a contact backed out of the shell; a properly inserted contact *can't back out!*

Another hazard with Sermos Power Pole connectors is polarization. (Most things in life aren't "idiot-proof.") If you leave the two halves of a Sermos connector (the black half and the red half) separate, it's quite easy to plug it in backwards because, aside from the color difference, the halves are identical. Sermos connectors, however, have slots built into their sides so you can join them in pairs. When you've established which orientation suits your fancy, a drop of instant glue will lock the two halves together *forever*. If you glue all the battery-pack connectors and your speed-controller connector halves in matching pairs (make sure they mate before you glue them!), you won't ever plug your battery in backwards again!

On a pan car with a saddle pack, you

(Continued on page 202)

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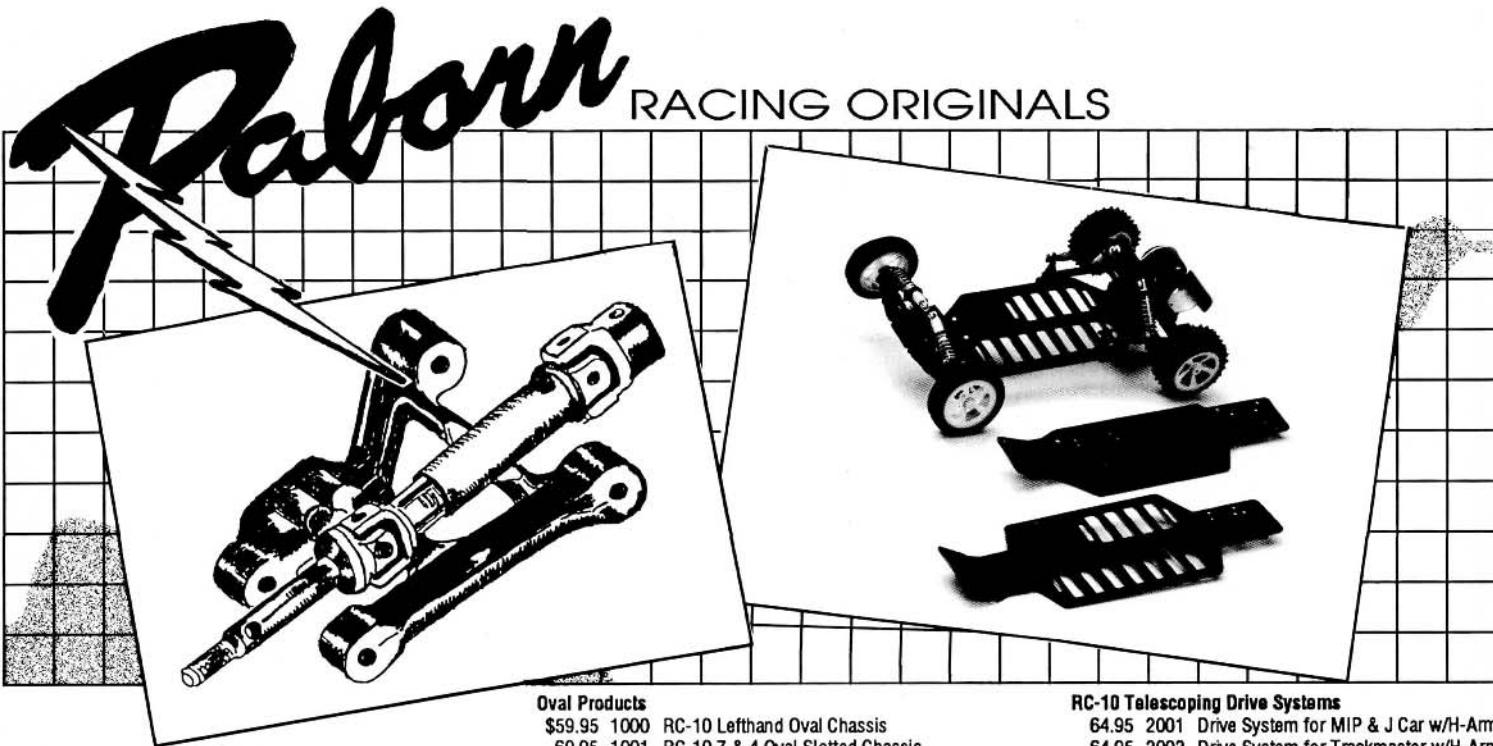
CONNECTOR INSPECTOR

(Continued from page 198)

can run a split-connector system that lets one lead go to the right side of the car and the other lead to its left. (This isn't an idiot-proof setup; you still have to remember red to red and black to black!) If you use the Sermos connector for both the battery and the motor connector, polarize them differentially to prevent the battery from being plugged into the motor leads of your speed controller. (This will prevent your controller from being blown off the face of the earth!) One last warning: put a matching connector on your battery charger. The charger's nasty alligator clips damage the silver plating on the contact, exposing the copper and causing power-robbing corrosion.

Sermos was the first company to introduce the modular-style connector to the R/C hobby, and several other companies have introduced similar ones (they'll actually work with one another). I've used the Litespeed* version, and its performance was similar to that of the Sermos one. I guess imitation is still the greatest form of flattery!

(Continued on page 215)



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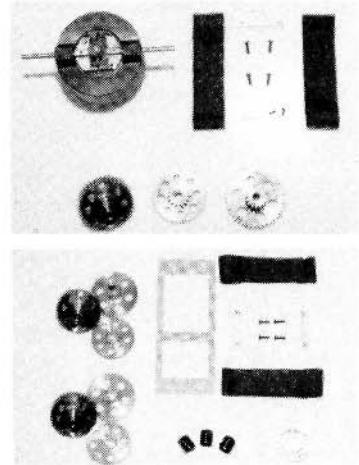
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CONNECTOR INSPECTOR

(Continued from page 202)

● **Deans Red Power Plug.** Deans connectors have been around for a long time, and they still seem to work well. They're easy to install because the stripped end of a monster wire snuggles between two pins, and you can easily solder it into place. When you install these connectors, watch the polarity: plug the two halves together to ensure that you get the red and black wire in the right place on the sec-

ond half.

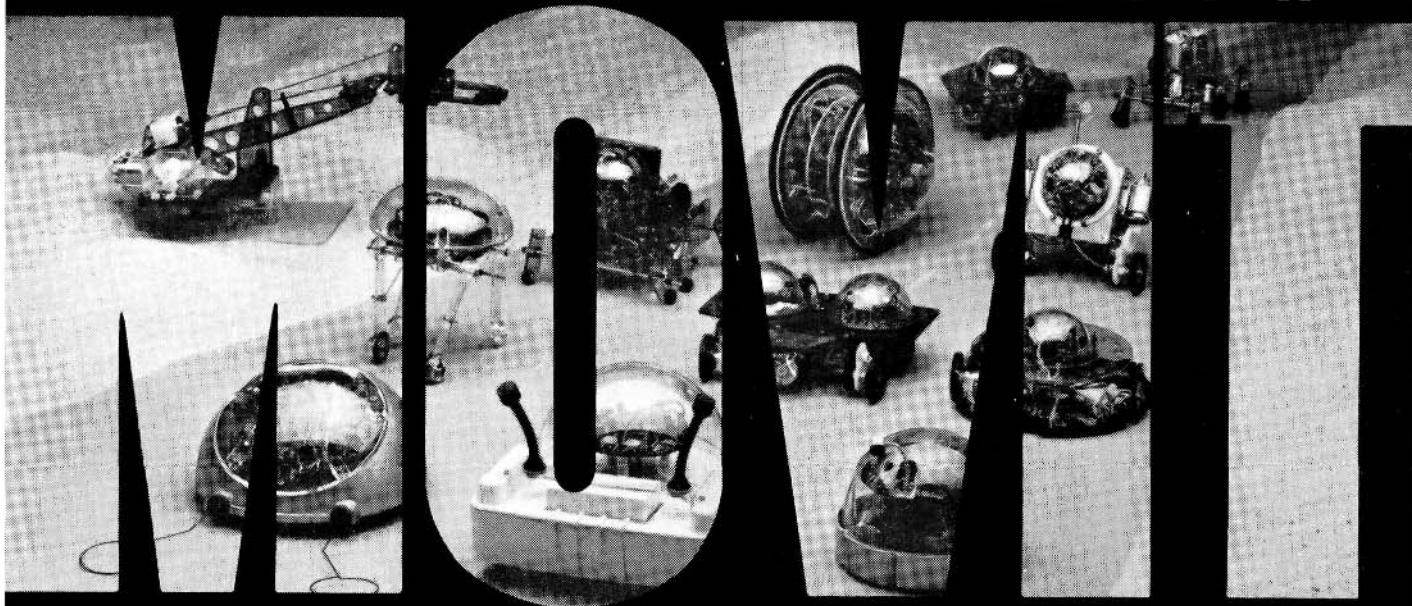
If you use them for both a battery connector and a motor connector, put the female halves on the battery leads and the speed controller's motor-output leads. Put the male halves on the input leads to the speed controller and the motor leads. With this setup, you can't plug the battery into the wrong side of the speed controller, but you can plug it directly into the motor when you test and clean the motor in the pits. One word of caution: cover the exposed solder joints with the supplied

shrink-tubing. A battery that's lying in a toolbox can set the world on fire if a screwdriver touches its exposed contacts.

● **Bold Creations PowerPipe/2.** This connector is similar to the Deans plug, except that the halves are identical. This makes it impossible to key a motor/battery setup to prevent the battery from being plugged into the speed controller's motor-output leads (which will destroy most speed controllers). I recommend that you only use them as battery connectors

(Continued on page 230)

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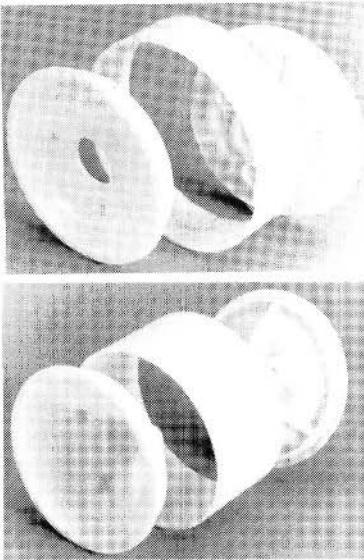
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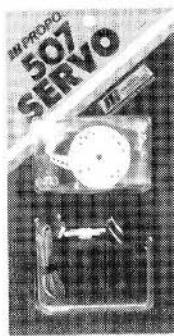


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Mount 2 1/8-inch front and 2-inch rear tires on these three-piece wheels without using glue. Use them again and again.

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For more information, contact Associated Electrics, Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.



JR PROPO JR 507 Servo

The JR Propo 507 servo offers high speeds and torque at an economical price. It comes complete with an accessory package, servo horns and mounting materials.

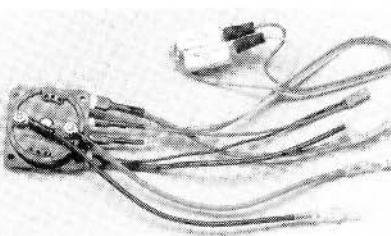
For more information, contact Hobby Dynamics, P.O. Box 3726, Champaign, IL 61826.



MRC Monster Beetle Q.D.

MRC's Monster Beetle Q.D. is a 2WD, 1/14-scale, off-road monster truck. Chrome-like exhaust pipes and engine details tell everyone that this isn't an ordinary ready-to-run car, and the injection-molded body comes in your choice of red, white, or blue. Made of durable engineering plastic, the chassis is perched atop 4 1/2-inch-diameter wheels and tires. The package includes a pistol-grip wheel radio with proportional steering, a speed controller with two forward and one reverse speed, and a power-indicator lamp. The Beetle's powerful electric motor drives a differential gear that you can set for high speed or high-torque obstacle climbing.

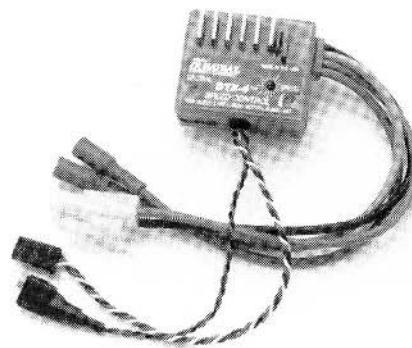
For more information, contact Model Rectifier Corp., 200 Carter Dr., Edison, NJ 08817.



DURATRAX Mechanical Speed Controller

The new DuraTrax rotary speed controller is durable and economical. It has three forward and one reverse speed, and it comes complete with Tamiya connectors and leads for BEC hookup.

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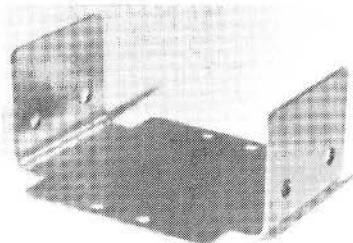


DTX-4 Electronic Speed Controller

DuraTrax now offers a reliable speed controller at a great price. Using Tempfet® technology, the DTX-4 protects your investment by shutting down before damage occurs. Fully proportional and designed for years of service, the DTX-4 comes with your choice of connector: Futaba J, Airtronics, Kyosho, or JR. Specifications: weight with wires, 1.75 ounces; voltage drop, 0.006 volt; voltage input, 6 to 10 cells; braking current, 25 amps; response, 15 to 20 milliseconds; current efficiency, more than 99 percent.

Price: \$99.95

For more information, contact Great Planes Model Distributors, 1608 Interstate Dr., Champaign, IL 61820.



ESP MANUFACTURING C-clip Chassis-Brace Kit

ESP's proven, one-piece chassis brace helps you avoid the usual chassis breakage once and for all. It makes the suspension system more rigid for greater overall strength and improved handling.

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Product no. 7025

Price: \$5 (2-fluid-ounce container with applicator cap)

For more information, contact Racer's Choice, P.O. Box 405, Medinah, IL 60157.



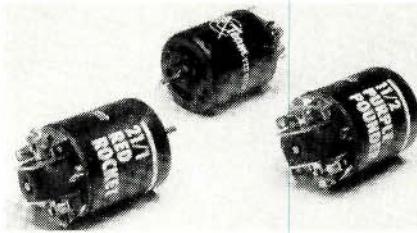
BOLINK Invader Monster Truck

Get ready for "big" off-road racing excitement with Bolink's new Invader Monster Truck! With the ground-gripping power of a 2.5:1 gear reduction, the Invader can tackle any terrain, and its fully independent front suspension handles superbly on sand or dirt!

Part no. BL-1364

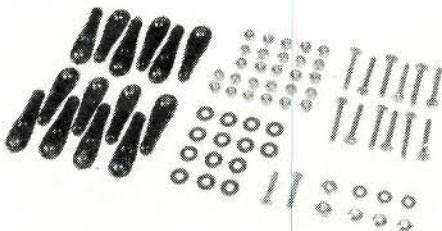
Price: \$169.95

For more information, contact Bolink, 420 Hosea Rd., Lawrenceville, GA 30245.



TEAM PIT STOP 9000 Series Modified Motors

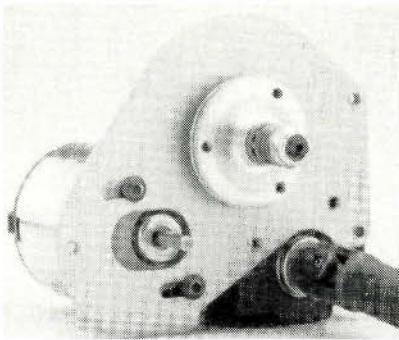
All motors aren't created equal! All Team Pit Stop modified motors are hand-wound (to ensure the exact number of winds), argon-welded, epoxied, hand-trued and individually balanced. Using Yokomo wet-magnet cans and endbells, these motors have won their owners numerous state and regional titles in on-road, off-road, dirt and paved oval. They're available in 28, 24, 21, 13, 12 and 11 single winds; 19, 17, 16, 13, 12 and 11 double winds; 16, 15, and 14 triple winds; and 14 and 13 quadruple winds. All motors are color-coded and marked with the number of winds.



4000 Series Steering & Suspension System

You can improve your car's reliability and performance without increasing its weight! Team Pit Stop's complete steering and suspension-arm system for the RC10 is now available for the JR-X2, the Ultima, the Traxxas Bullet, the Yokomo, the Lazer and 1/10- and 1/12-scale on-road cars. The RC10 system includes: 2-56 and 4-40 stainless-steel hardware; .016-inch aluminum retaining washers and sub-miniature aluminum locknuts; and ball ends for seven links to convert the RC10 suspension and steering arms into the most reliable, free-moving, no-play system available.

For more information, contact Team Pit Stop, 12353 SW 132nd Ct., Miami, FL 33186.



A&L Power Clutch

A&L's revolutionary Power Clutch is the first slipper clutch that allows you to change the spur gears without touching the diff adjustment. It reduces diff, gear and drive-line wear and prevents your car's wheels from spinning, so you get better traction and control! Let the Power Clutch remove slipping abuse from your diff...and keep racing!

Part nos. 280 (fits the A&L Lethal Weapon and MIP transmissions); 281 (JR-X2).

Price: \$38.95; \$42.95.



Chevy Body

A&L's new Chevy body is a true, aerodynamic, 1/10-scale version of the full-size truck. It has flared fender wells, a large hood scoop, a low-angle windshield and a long sloping roll cage, so you can mount it low on the chassis and still have enough clearance for monster-truck tires.

Part no. 9500

Price: \$19.95

For more information, contact A&L Mfg., P.O. Box 2115, Corona, CA 91718.

WHAT'S NEW

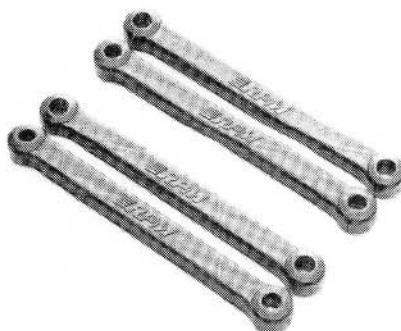


RPM JR-XT Extra-Wide Rear Links

RPM now sells extra-wide rear links for the JR-XT and JR-X2 truck conversions with the five-link system. These heavy-duty links have no grooves or ribs in which dirt can collect. They'll make your truck $\frac{1}{2}$ inch wider in the rear, and this increases its stability and suspension travel. For a great combination, use them with RPM's extra-wide front arms (part no. 7350, \$11.95).

Part no. 7305

Price: \$7.95/set of four



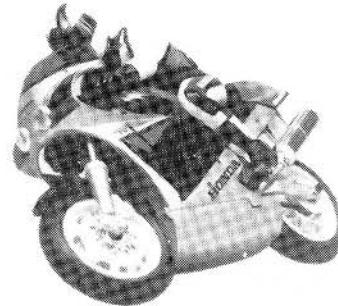
JR-X2 Heavy-Duty Rear Links

RPM now makes heavy-duty replacement rear links for the JR-X2 five-link system. Designed without grooves or ribs, they're of strong, stiff, injection-molded black nylon that isn't brittle.

Part no. 7300

Price: \$7.95/set of four

For more information, contact RPM Custom Engineered R/C Products, 14978 Sierra Bonita Ln., Chino, CA 91710.

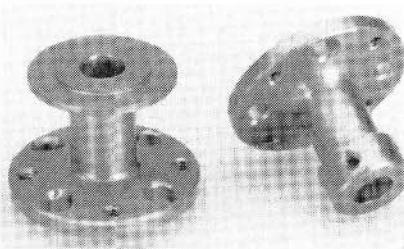


ROYAL PRODUCTS CORP. Honda NC30 Supersport Kit

The assembled RC30 motorcycle was a hit last year, and Royal Products hopes its new Supersport Kit will be just as successful. The Supersport Kit goes beyond what you'd expect from a traditional kit. All the exterior parts (including the shields, driver and body fairings) are painted in beautiful metallic silver, black and red. The kit includes a steering servo and an electronic speed controller (with braking) that come already assembled and wired for use with Futaba 2-channel systems. Just put it together, add a receiver, a transmitter and a battery pack, and the Honda is ready to go!

Price: \$99.95

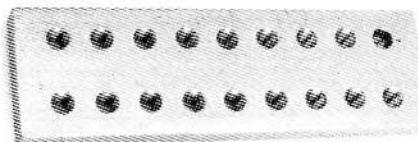
For more information, contact Royal Products Corp., 790 W. Tennessee Ave., Denver, CO 80223.



MK ENGINEERING Lightweight Wheel Hubs

MK Engineering now offers light, high-grade, aircraft-aluminum wheel hubs for most popular $\frac{1}{10}$ -scale on-road cars. These hubs are precision-machined to exacting tolerances to ensure that your wheels run as true as possible. Each pair can be used on a standard diff without

internal ball bearings, or with Pro-style diffs that use flanged bearings on the drive-side hub. Hubs are available for the 10L, the Lynx II and all other cars that use a Bolink-style axle, and they come in plain aluminum, or a variety of anodized colors. Hard-anodizing is available for \$5 extra, or you can have your existing hubs lightened for \$8, plus postage and handling.



Glow-Plug Holder

The MK machined-aluminum glow-plug holder holds all the plugs you need for racing; you can even carry multiple plugs of different grades to suit various conditions and fuel types. This design frees your glow-plug wrench for use on deep heads. Because of its thick construction, the holder also prevents damage to long- and short-reach plugs. It's available in a variety of anodized colors.

Price: \$19.95 (anodized); \$14.95 (plain aluminum).

For more information, contact MK Engineering, P.O. Box 216, Seymour, CT 06483.



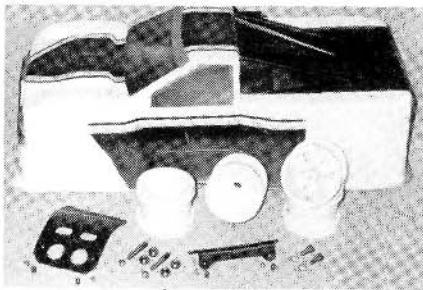
McALLISTER RACING NPT-90 GTP Body

Nissan's new, full-size NPT-90 GTP road racer continues a winning tradition. Start your own winning tradition with the NPT-90 body from McAllister Racing!

Part no. B146

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.

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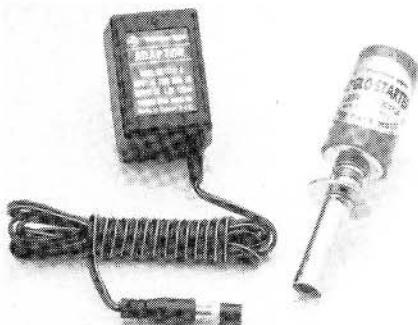


A&L Monster-Truck Conversion Kit

Use the A&L conversion kit to join the fastest-growing R/C class—monster trucks! You get a one-piece front bumper, front axles, bearings, front and rear body mounts, a full set of mini body posts and A&L's popular, cone-shaped, dyeable white-nylon, monster-truck wheels. To top it all off, there's A&L's 1/2-ton Chevy stadium-truck body!

Part nos. 5030 (RC10); 5054 (JR-X2); 5020 (Kyosho Ultima); 5024 (Kyosho Mid or Laser).

For more information, contact A&L Mfg., P.O. Box 2115, Corona, CA 91718.



THUNDER TIGER Glo-Starter

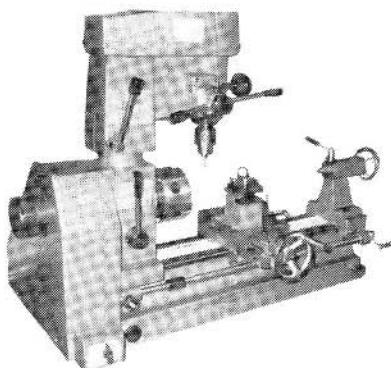
The Thunder Tiger Glo-Starter (pictured) and Long Reach Glo-Starter are reliable, handy, economical ways to light glow plugs and get them to fire-up your engines. As many as 50 15- to 20-second starts are possible from the single, fully-charged Ni-Cd power cell inside each pocket-size Glo-Starter. A locking glow-head tube securely holds either model on the glow plug, and thumb pressure quickly releases it. The separate wall charger has an extension

cable and an indicator light that lets you know when it's recharging. Full recharges are possible overnight from any 110V AC outlet.

Part nos. 110480 (Glo-Starter); 110482 (Long Reach Glo-Starter).

Price: \$24.95; \$25.95.

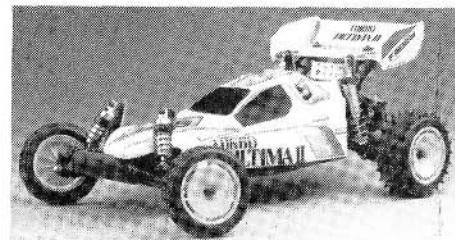
For more information, contact Global Hobby Distributors, 18480 Bandelier Circle, Fountain Valley, CA 92728.



PORTA-POWER INDUSTRIES Shop Mate Machining Center

The heavy-duty Shop Mate Lathe and Machining Center is manufactured to exacting tolerances (.001 inch and less). It has metal gears and a 36-speed power feed with six spindle speeds, and it comes complete with these accessories: a three-jaw chuck with inside and outside jaws, a drill chuck with key, a four-way tool post, lathe centers, wrenches and drift. The photo shows the optional mill-drill attachment, and a computer-controlled (CAM) unit that can be interfaced with a computer (CAD) system is also available.

For more information, contact Porta-Power Industries, P.O. Box 34026, Chicago, IL 60634.



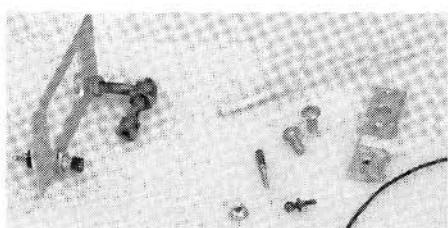
GREAT PLANES Kyosho Turbo Ultima II

Kyosho announces the Turbo Ultima II 2WD off-road buggy! It has many of the Ultima II's standard features, plus many previously optional performance parts, e.g., Kyosho Gold shocks, FRP shock towers, 14 ball bearings, a ball-type differential, a Kyosho Mega Outlaw stock motor and a mechanical speed controller with three forward speeds and one reverse. Specifications: height, 6.3 inches; weight, 3.5 pounds; length, 14.8 inches; width, 9.5 inches.

Part no. KYOCO184

Price: \$279.95

For more information, contact Great Planes Model Distributors, 1608 Interstate Dr., Champaign, IL 61820.



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MK's Parachute Kill Switch is for 1/4-scale dragsters, funny cars and pro stockers that use parachutes. Designed to cut your car's engine as soon as the chute is deployed, this special switch greatly reduces the risk of runaway when your car gets farther away from the transmitter and potentially out of range. All the necessary brackets and hardware are included.

Price: \$16.95

For more information, contact MK Engineering, P.O. Box 216, Seymour, CT 06483.

CONNECTOR INSPECTOR

(Continued from page 215)

and that you hard-wire your motor. The solder joints on these connectors must be sleeved with shrink-tubing, too, but it isn't supplied with them.

● **Corally Battery Connectors.** I hadn't seen this type before. It comes in a package with two male ends that go on the speed controller's battery wires and five pairs of female sleeves that you solder directly to the cells of the battery pack. In one package, Corally supplies enough parts to set up all the batteries necessary to run a car! There isn't, however, any way to key the Corally connectors for polarity, and it could be just a matter of time before, in the heat of battle, you plug in the battery backwards. They might, however, be acceptable in a pan car with a split saddle pack, because the red battery wire is on one side of the car and the black on the other.

They don't use battery wires, so you eliminate the need for two power-robbing solder joints between the battery wires and the battery. (A normal setup has six joints between the battery and controller: two at the battery-to-battery wires, two at the

battery-wires-to-battery connector and two at the speed-controller half of the battery connector.)

I think that the Corally connector system would also make a good motor-connector system. It's possible to solder the female sleeve directly to the motor's brush hoods. Then, you can solder the brush wires directly to the sleeves. Put the male ends on the motor wires and plug it into the motor. If you reverse it, the car will only run in reverse.

● **Trinity Power Plugs.** This connector is quite similar to the Deans Power Plug because it has true male and female halves that allow idiot-proof battery/motor keying. Because of its fairly high voltage loss and high cost, I'd use the Deans if I wanted this type of connector.

● **Race Prep Pro Connector.** This connector has two disadvantages that prevent me from using it as a battery connector. First, although it has keying that prevents you from plugging it in all the way, you can still plug it in backwards and it still makes contact! (It's obvious that it's backwards because it won't completely plug in but, by then, contact has been made and the damage has been done!) You'd have to be extremely care-

ful to avoid damaging a speed controller with this connector.

The second problem is its high voltage loss. It would work as a motor connector because accidental reverse polarity doesn't destroy a motor, but the voltage loss is unacceptable to me.

PARTING SHOT

To see if all this "jive" about voltage loss has any merit, I conducted a one-on-one test of the worst and the best to see if there was any performance difference.

I rigged a Race Prep stock motor with an 8x6 airplane prop. A quick check showed that this rig turned about 4000 to 5000 rpm and pulled about 25 amps on a 6-cell pack. I built two wiring harnesses: one used the generic Tamiya-style battery connector with its cheap, plastic-coated, 16AWG wire, and the bullet-style motor connectors with Race Prep 13AWG wire; the second used two sets of Sermos Power Pole connectors (one pair for the battery and one pair for the motor) and Stage III Super 13 wire. Both harnesses measured about 12 inches long. I charged a 6-cell battery pack (with my new Class* model 188 peak charger), and then I ran the

(Continued on page 232)

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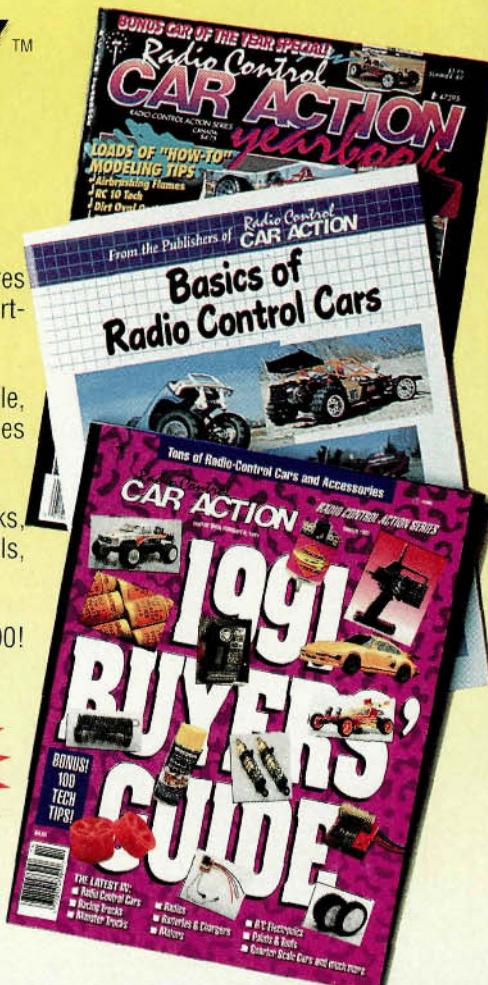
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CONNECTOR INSPECTOR

(Continued from page 230)

motor-prop combination for 4 minutes using the stock-connector wiring harness, noting the rpm every 30 seconds.

I let the rig rest overnight and ran the test again the next day using the Sermos connector and wire setup. Throughout the run, the Sermos setup produced 100 to 200 more rpm than the stock setup, or (potentially) an 80- to 120-foot lead after 4 minutes!

It's real folks! Bad wiring and connectors can kill your chances of winning!

*Here are the addresses of the companies mentioned in this article:

Team Associated, 3585 Cadillac Ave., Costa Mesa, CA 92626.

Sermos R/C Snap Connectors, Cedar Corner Stn., P.O. Box 16786, Stamford, CT 06905.

Bold Creations, 1305 Abbey Rd., Round Rock, TX 78681.

Race Prep, 20115 Nordhoff St., Chatsworth, CA 91311.

Deans Connectors; distributed by Ace R/C, Inc., 116 W. 19th St., Box 511C, Higginsville, MO 64037.

Trinity; distributed by Speedworks, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Corally; distributed by Du-Mor R/C, Inc., 1002 Union Landing Rd., Cinnaminson, NJ 08077.

Stage III, 1189 Chicago Rd., Troy, MI 48083.

Litespeed, P.O. Box 4765, Spokane, WA 99202.

Class Recreational Products, RD 1, Box 187A, Utica, NY 13502. ■

MARUI BIG BEAR

(Continued from page 144)

nize that you put extra effort into your kit. A couple of small brushes and glossy model paints are all you need. I used tape for the helmet stripes.

BEAR BEATIN'

"This truck really moves!" These were my first words when I switched on the Big Bear's receiver and pressed the throttle on the two-stick Techniplus transmitter. Gravel and sand shot out from under its rear wheels as the Big Bear charged down the beach and was put through a few quick turns.

As shown by the wheelies pulled straight out of the sand, there's no lack of power or pickup in this package. The rear-wheel-drive Bear handles better on hard-packed surfaces, but it had little trouble blasting up and down the beach. Any problems? I did notice that the front wheels tended to snag on the body if I applied full turn in either direction.

This truck just wouldn't quit, and we were soon climbing and jumping rock crevices—usually landing tires first! The manual speed controller performed well

and proved itself a viable alternative to the expensive electronic controllers. This speed controller has been a trouble spot on past Big Bears, so it remains to be seen whether this unit is up to the task. Modified motors are out of the question because they'd cause an instant meltdown. You should also be careful about how you treat the speed controller with the stock motor. Avoid thrashing from forward to reverse at high speeds and, to ensure it provides service for a while, keep the unit as dry as possible. The heavy-duty front bumper really protected the truck—even during some inadvertent head-on collisions with unrelenting telephone poles.

As Staff Photographer Yamil Sued snapped the last photos for the day, I had already made up my mind: the Big Bear is a heck of a lot of fun! It's easy to assemble and, on its first run, it performed almost perfectly without any adjustments. Although it creaked and groaned after a hard hit, nothing broke or loosened; nothing fell off; and the radio and battery didn't give me any trouble. For an out-of-the-box truck with no after-market modifications, the Big Bear ran extremely well.

A BETTER BEAR?

After you've run the Big Bear a few times, you might want to try a few upgrades. The supplied battery connector contains a male adapter that tends to come off when you're changing packs. You'll probably want to switch to a Tamiya-type connector for the speed controller. Also, when the Bear is performing stunts, the large front tires seem to exert a lot of pressure on the front servo-arm ball joints. During a subsequent session, the left one on mine came off several times, so I plan to replace both front ball joints with stiffer ones.

With a few minor upgrades, the Big Bear is a solid kit that packs a lot of fun into one tough package!

*Here are the addresses of the companies mentioned in this article:

Marui; distributed by Imex Model Co., 53 Trade Zone Ct., Ronkonkoma, NY 11779.

Acoms; distributed by MRC, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Trinity, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Pactra/Plasti-Kote Co., 1000 Lake Rd., Medina, OH 44256. ■

SCOPING OUT

(Continued from page 156)

because: its suggested retail price of \$89.99 is quite low for such a high-performance unit; if you're handy with a

(Continued on page 234)

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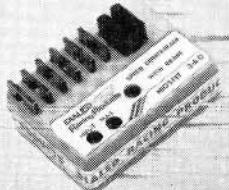
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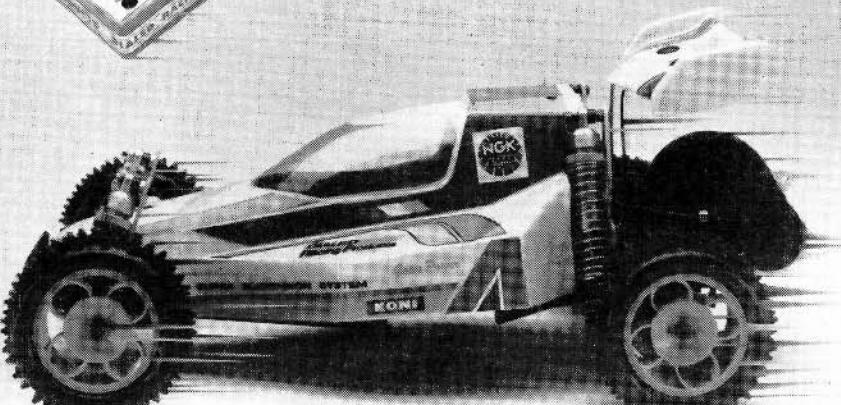
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SCOPING OUT

(Continued from page 232)

soldering iron, you could replace the poor wire with some Stage III Super 13 wire. Doing this voids the warranty, but at \$15 a pop, I'm not sure the warranty is a treasure anyway.

I'd also risk a meltdown by eliminating the fuse. If you're careful, meltdown isn't likely. Don't hold the pedal to the metal when things go wrong, i.e. if the car quits, stop and fix it; don't just hold down the trigger while the smoke pours out. Finally, I'd hard-wire the motor and use Sermos Power Pole connectors on the battery. Do all this, and I think you'll have a "trick" setup that's high on performance at a budget price.

*Here are the addresses of the companies mentioned in this article:

Aristo-Craft/Polk's, 346 Bergen Ave., Jersey City, NJ 07304.

Sermos R/C Snap Connectors, Cedar Corners Stn., P.O. Box 16787, Stamford, CT 06905.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

Novak Electronics, Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

TRUCK PULLS

(Continued from page 176)

2WD PULLERS

This class (which is a good one for beginners to start with) had only a handful of competitors. Ron Crawford's "The Beast" pulled the 45-pound sled 19 feet, 4 inches to grab the top spot. John Amann's Blackfoot narrowly missed with a pull of 18 feet, 5 inches. The final spot went to Paul Lavecchia and his "High Voltage" Monster Beetle (18 feet, 1 inch). For this most basic of classes, the competition was very close!

To pull the 60 pounds used in their class, 2WD Super Stock trucks are allowed seven cells (one more than Stock pullers). Roger Maynard was the toast of the class as his Big Brute brought the weight out to the 25-foot, 1-inch mark. With a pull of 20 feet, 8 inches, Ken Moore's Kyosho-powered Blackfoot made a respectable showing. Paul Morziani took the final spot with a disappointing 12-foot, 5-inch effort.

It was time to up the ante as the 2WD Modified Class hit the track! Only two vehicles made the 95-pound limit, and Roger Maynard and his Astro-Flight-

(Continued on page 238)

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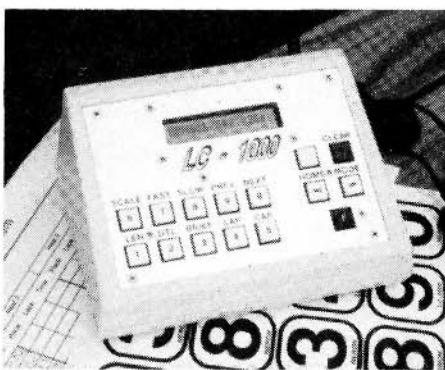
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TRUCK PULLS

(Continued from page 234)

driven Big Brute took the top spot again with a pull of 26 feet, 9 inches. The only female competitor, Doreen DeJohn, showed the good ol' boys how it's done: her "Jersey Rose" completed an 18-foot, 4-inch run to take the silver. Joe Baril's Lunch Box captured the final spot, but he failed to make the pull-off.

Andrew Lee's Bennett rig won the 2WD Sportsman Class with a 110-pound pull of 26 feet, 9 inches. Richard Morrisseau ran a close 2nd; his Black Magic-powered scratch-built puller put in an impressive 25-foot, 1-inch effort. With a 16-foot pull, Wayne Grundy's "Prospector" bagged 3rd, but Bill Phillips' "Bad Attitude" and Pete Kulessa's "Rodent" failed to make the 110-pound pull-off.

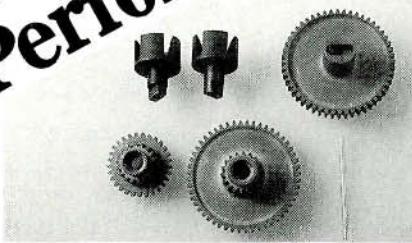
In the popular 2WD Open Class I division, 10 pullers were brought to the line. With a 14-cell, 4000mAh maximum and a one-motor limit, it was time for some serious moaning and groaning! Only three sleds were able to break out of the 140-pound limit for the 210-pound pull-off! Roger Alphonse's Concours-winning "Long Tail" crushed the field with a 25-foot, 10-inch pull; Wayne Grundy's scratch-built "Prospector" went a respectable 21 feet, 8 inches before meltdown; and Richard Morrisseau's "Bandit" was a close 3rd with a pull of 20 feet, 1 inch. Paul Morziani took 4th with a Parma sled that hauled 140 pounds 28 feet, 11 inches.

The fun and games came to a shuddering halt when the 2WD Open II ground-pounders hit the carpet! This is when you start feeling sorry for the volunteers who have to move the sled back down the track after each run! Again, only two sleds made it to the 300-pound pull-off! (To give you an idea of the load I'm talking about, picture Steve Pond with his camera case!)

Third place went to Tom Riney, whose Kyosho-powered scratch-built truck hauled 210 pounds 25 feet, 4 inches. Peter Kulessa's scratch-built rig went 20 feet, 4 inches at 300 pounds, and Scott Weigel took top honors with an Astro Flight-powered scratch-built that managed a carpet-melting burn of 22 feet, 10 inches! Larry Bennett's Black Magic-powered Bennett could only manage 5th with a 14-foot, 7-inch effort at 210 pounds.

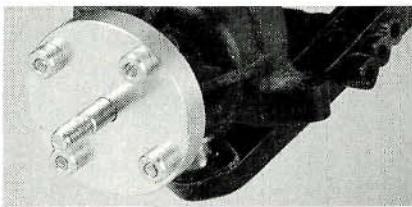
(Continued on page 244)

Maximum Pulling Performance



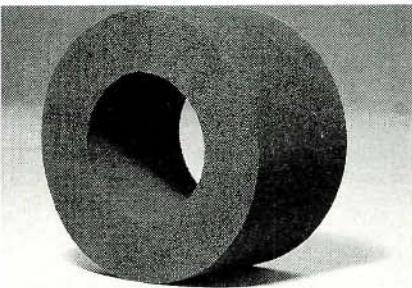
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TRUCK PULLS

(Continued from page 238)

FOUR-WHEELING ACTION

Next, the four-wheelers were ready to show their stuff. The field may have been smaller than that of 2WD, but the action was just as hot!

In 4WD Stock, New Jersey's Daryl DeJohn drove his White Lightning out the back door at 35 pounds. Ron Crawford was unable to get his Yokomo off the line, and he settled for the runner-up spot. In 4WD Super Stock and Modified, Wayne Rydz also took it out of the park. His Black Magic-powered Bruiser went the distance with 50 and 65 pounds, respectively.

In the Open I Class, Charles Wojack broke on the line at 120 pounds for 3rd. Domingo Colon's Bruiser made it 12 feet, 10 inches before losing traction, and Russ Sirais Jr. went the distance with his Trinity-powered scratch-built to claim the title.

With a pull-off weight of 311 pounds (oh, my aching back!), the 4WD Open II Class was the hands-down winner as far as brute force was concerned! Larry Bennett drove his "namesake" to a class win with an awesome full pull. Chuck Wojack put in a great effort with a 23-foot haul, and Richard Mogle rounded out the top three with a 20-foot, 2-inch run.

The dual-motor classes closed out the event. Eight competitors went head to

head, and four vehicles made the 100-pound pull-off. Bill Phillips (of Winchester, NH) drove his Clod Buster to 5th place with a 21-foot, 10-inch effort at 60 pounds. Claude Kuzmiak made the pull-off and took 4th with a 10-foot, 7-inch haul. Ed Kraemer Jr. grabbed the bronze (16 feet), and John Norcross was just out in front (18 feet, 2 inches) for 2nd. Gary Diehl's Trinity-powered Clod Buster clinched top honors with a great 20-foot, 4-inch pull.

In Dual Mod, five drivers (out of a field of 10) attempted to melt their drive lines in the 200-pound pull-off. Ray Wolfe Jr. won the Clod Buster sweep with a full pull! Coleman Clark (20 feet, 9 inches), Bill Pappas (20 feet, 5 inches), Steve McBride (18 feet, 4 inches) and Mike Guertin (18 feet, 1 inch) rounded out the very competitive field.

This NR/CTPA event was well-organized and well-run, with plenty of action and a unique blend of sportsmanship and competition. Next time there's a monster-truck/truck-pulling contest in your area, stop by and see what it's all about! Thanks to Doug Avery and Dave Sproul for their help, and to all the participants and spectators (especially for their rad comments about our magazine!). See you at the Nationals!

GRAUPNER SYSTEMS

(Continued from page 184)

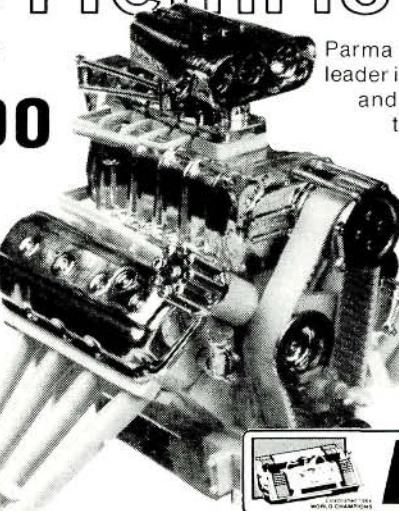
is less likely to crack when stressed). To

(Continued on page 247)

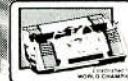
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GRAUPNER SYSTEMS

(Continued from page 244)

ensure a watertight seal, apply a final application of silicone sealant to the seam. Now, all that's left are the radio installation and final finishing of the hull.

Radio installation was easy, because the servo cutouts fit the Futaba* FP-S48 servos like a glove. The steering servo used the original round horn owing to the small steering angle allowed (5 to 10 degrees maximum). The speed controller requires a longer horn (similar in length to the actuating lever on the controller).

My only other recommendation is that you should throw out the molded battery holder for the receiver pack. This cup-shaped holder will do more harm than good by holding water rather than keeping it out. After a complete coat of paint and some final detailing, I gave the two 6-cell packs a fresh charge, and it was time to hit the water.

CAT CAPERS!

My first tests of the Systems cat were on Long Island Sound, which has the roughest waves you'd ever want to encounter with a boat of this size. I put the boat on the water, squeezed the throttle, and it jumped up on step as quickly as you can expect a surface drive to do.

The twin motors never faltered as I put the boat through its paces. Even though the water was rough, the hull's inherent stability kept the boat on an even keel; in fact, there wasn't much I could do to throw it off-balance. Even at full throttle, hard-left to right-rudder just resulted in fully controlled turns. Owing to the limited amount of steering throw allowed (5 to 10 degrees) to prevent flex-shaft binding, this boat had no trouble turning. My reservations about its maneuverability soon vanished! Using the round servo horn with the stock linkage configuration, the drive only turned 5 degrees off the center line. Even then, at full throttle, the boat took turns as tight as 8 feet. To make it turn on a dime, you'd just need a larger servo horn to bring the steering to the 10-degree maximum.

CURING THE CAT'S CRAWL

The only disappointing aspect of the boat's performance was its speed. With the stock plastic prop and 7.2 volts

(Continued on page 254)

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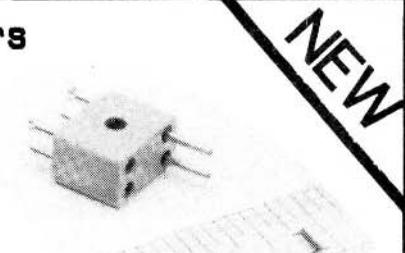
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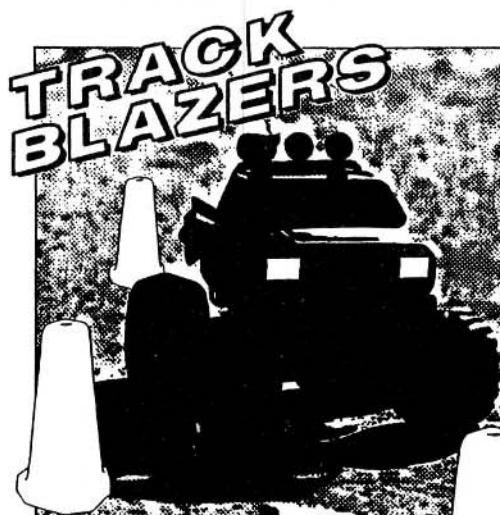


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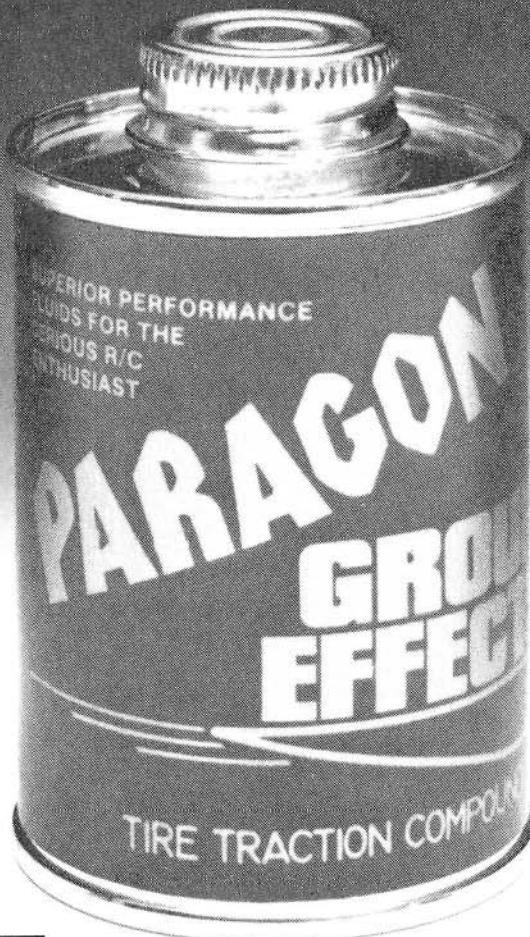
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GRAUPNER SYSTEMS

(Continued from page 247)

powering the motors, it topped out at roughly 12 to 15 mph. After a few 8-minute runs with the 6-cell 1200mAh SCR packs, I was confident that a prop change was in order. For the next go-around, I installed an Octura* conversion shaft and the monster X4557 three-blade beryllium prop, pairing them with 7-cell 1700mAh SCE packs.

During this run, the boat handled as well and went much faster. As far as I can estimate, its straightaway speed jumped to 25 mph. At this pace, I had little confidence that the batteries would go the distance, but I turned in consecutive runs of 6 minutes, and the batteries were strong for almost 5 minutes. That's how this boat *should* perform!

The stock hardware handled anything I threw at it—even with the larger prop and 7-cell packs—but I wouldn't recommend that you try to get more out of the stock hardware. After 6 minutes, the components were all as hot as I'd ever like to see them. To improve performance further, you'd need different motors, heavier wiring and a strong electronic speed controller, or a mechanical unit that's capable of handling the substantially higher current flow. For racing, this boat would have to run in the P class, which allows 12 cells under IMPBA rules, but your competition would surely be wiring them to produce 14.4 volts, which would require a smaller prop. If having fun with a fast boat is what you want, the Graupner Systems cat will deliver!

Out of the box, the Systems cat is the most stable, big electric boat that I've run. To race with it, you'll have to

(Continued on page 256)

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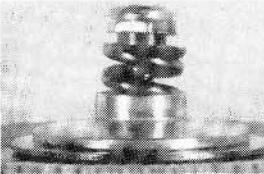
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GRAUPNER SYSTEMS

(Continued from page 254)

modify it, but judging from its performance with the minor modifications I made, it could be a real contender!

**Here are the addresses of the manufacturers mentioned in this article:*

Graupner, distributed by Hobby Lobby International, P.O. Box 285, Brentwood, TN 37027.

Futaba Corp., 4 Studebaker, Irvine, CA 92718. Octura Models, 7351 North Hamlin, Skokie, IL 60076. ■

FIVE YEARS

(Continued from page 120)

situation seems to have overtaken the 1/4-scale "quadrant." Names like Pacesetter and Raco (with the Jac Rabbit) became fairly well-known, but the 1/4-scale craze only experienced a "flash" growth. The cars are hand-built and expensive; noise was again a factor; and they needed a large, safe area to run on; but safety concerns were what mainly kept would-be manufacturers away. Liability insurance is an unfortunate reality of modern living, and it scares manufacturers away from products that are potentially dangerous. Like 1/8-scale racing, 1/4-scale still has a faithful following, but will it grow more?—even in a limited way? The jury is still out.

AND THEN THERE'S TRUCKS!
Remember trucks? The pullers, off-road

racers and crushers all stem from the monster-truck era; and which truck caused more excitement than any other?—the Blackfoot! The Big Bear was around first, but the Blackfoot, Monster Beetle and the venerable Clod Buster led the charge!—a charge that's stronger than ever, but now split and going in several directions.

Why? Where there are trucks, there are smiles—lots of them. I've already mentioned the trucks' strong audience appeal at pulling events. You should hear the laughter that's typical at off-road monster-truck races; these people know how to have fun! We credit the Marui Big Bear races with starting the monster truck off-roading cult, but the Blackfoot started it all.

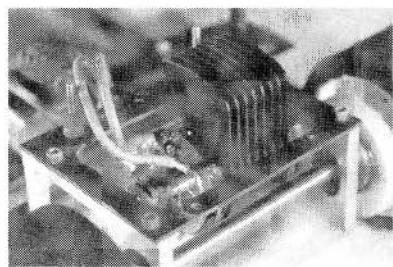
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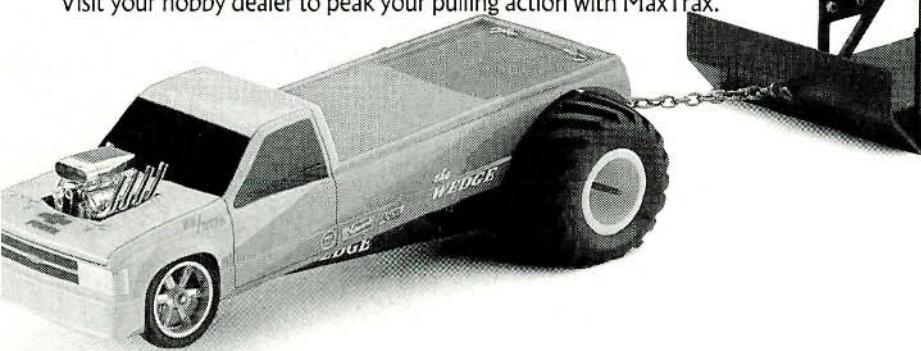
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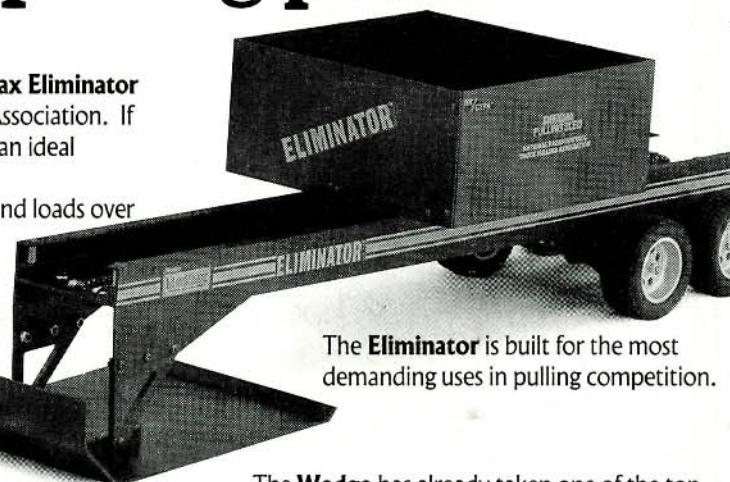
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